Ed: Burriola

AN

ESSAY

Concerning the

NATURE

OF

ALIMENTS,

AND THE

CHOICE of THEM,

According to the different Conſtitutions
of HUMAN BODIES.

In which the different Effects, Advantages
and Diſadvantages of Animal and Vegetable
Diet are explain'd.

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DUBLIN:

Printed by S. POWELL,
For GEORGE RISK, at the *Shakeſpear's Head*,
GEORGE EWING, at the *Angel* and *Bible*, and
WILLIAM SMITH, at the *Hercules*, Book-
ſellers in *Dame's-Street*, MDCCXXXI.

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MVSEVM
BRITAN
NICVM

THE
PREFACE.

W*HAT gave Occaſion to the following* Eſſay *is briefly what follows, my learned and worthy Friend Dr.* Cheyne, *ſome Years ago publiſhed an Eſſay upon* Health and long Life, *in which he gave a Proof both of his Judgment and Humanity. This Book was receiv'd by the Publick, with the Reſpect that was due to the Importance of its Contents; it became the Subject of Converſation, and produc'd even Sects in the dietetick Philoſophy. In ſome of thoſe ſympoſiac Diſputations amongſt my Acquaintance, being appeal'd to; I happen'd to affirm that the dietetick Part of Medicine depended, as much as any of the reſt, upon ſcientifick Principles: Being call'd upon to make good my Aſſertion, I compos'd the following ſhort Treatiſe which is properly ſpeaking only an Eſſay or Attempt of a* Phyſiology of Aliment. *The moſt of it was wrote in a Situation, where I had no Aſſiſtance except from Extracts out of ſome imperfect Editions of the Works of the moſt learned and induſtrious* Boerhaave, *and from a very excellent Edition of his Chymiſtry by Dr.* Shaw, *and Mr.* Chambers. *This I am* *am oblig'd to ſay once for all, to ſave my ſelf the Trouble of perpetual Quotations: The Circumſtances of ill Health, and Abſence from my Books in which I compos'd it, and the Want of Leiſure ſince to correct it ſufficiently, may be ſome Excuſe for the Want of that Accuracy which the Subject deſerves, and which I frankly own, I have diſcover'd in ſome Things of ſmall Moment ſince the Book was printed off. I am likewiſe obliged to make uſe of a very common and trivial Reaſon for publiſhing it at this Time,* viz. *the Approbation of ſome Friends who perus'd it, and perſuaded me that it might be of ſome Uſe to the Publick. I can ſay but little of the Merit of the Performance, but a great deal of that of the Subject; for ſurely the Choice and Meaſure of the Materials of which the whole Body is compos'd, and what we take daily by Pounds, is at leaſt of as much Importance, as of what we take ſeldom, and only by Grains and Spoonfuls.*

The Reader muſt not be ſurpriz'd to find the moſt common and ordinary Facts taken notice of: In Subjects of this Nature there is no room for Invention; many important Conſequences may be drawn from the Obſervation of the moſt common Things, and analogous Reaſonings from the Cauſes of them.

I believe a Reader with as much Anatomy as a Butcher knows, and moderate Skill in Mechanicks, may underſtand the whole Eſſay, provided he goes through it at Leiſure, and with Attention: To a Perſon ſo qualify'd many Obſervations concerning his own Conſtitution will occur, which I was not capable of making; as for the hard Words which I was oblig'd to uſe, they are either Terms of Art, or ſuch as I ſubſtituted in the place of others, that were too low, and vulgar; the Reader will find moſt of them explain'd at the Beginning of the Book: And I hope an Indulgence to a few, will not be reckon'd an Indignity to the reſt; and that I ſhall not be ſuſpected of Affectation, where my principal Intention was Perſpicuity. In Subjects of this Kind, one is oblig'd in the ſame Paragraph, to *join many Particulars together in one Propoſition; becauſe the Repetition of the Subſtantive Verb would be tedious and unneceſſary. This hinders the Stile from being ſmooth, but not from being perſpicuous.*

I have laid a Plan for treating the other Parts of Diet, as Air, Reſt, and Motion after the ſame Manner; but I am oblig'd to delay the Execution of my Deſign till I have more Leiſure.

I do not preſume to inſtruct the Gentlemen of my own Profeſſion; and if any of them ſhall inſtruct me better, I declare before-hand that I am very willing to be convinc'd: I will not defend any Miſtake, and at the ſame time I do not think my ſelf oblig'd to anſwer every frivolous Objection.

THE CONTENTS.

CHAP. I.

Obſervations drawn from the Alterations which the Aliment undergoes in its Paſſage into the Blood. Page 1

The Neceſſity of Chewing. ibid.

The Virtues and Uſefulneſs of the Spittle for Digeſtion. 2

The proper Aliment of ſuch as do not chew. ib.

The Action of the Stomach upon the Aliment explain'd. 3

The Liquor of the Stomach in a ſound State not acid. ib.

How ſpirituous Liquors hurt the Stomach. 4

Conjectures about the Cauſes of Depravation, and Loſs of Appetite. ib.

The Effects and Cure of too great Repletion of the Stomach. ib.

Symptoms of Depravation of the Functions of the Stomach. 4
The Digeſtion of the Stomach reſembleth vegetable Putrefaction, and aboliſheth the ſpecifick Difference of all Subſtances. 5
The Qualities of the Gall, its Action in diſſolving the Aliment. Bitters a ſort of ſubſidiary Gall. Symptoms of Depravation of the Functions of the Gall. 6
The Quality and Uſe of the pancreatick Juice. 7
Subſtances too Viſcous or Acrimonious, why hurtful in the firſt Paſſages. 8
Symptoms of Depravation of the Function of the Inteſtines. ibid.
The Mechaniſm of Nature in converting Aliment into Animal Subſtances. 9
The Liquors ſecern'd from the Blood, re-enter it again with the Aliment. ib.
Unſound Juices, weak ſolid Parts, and Obſtruction of the Glands of the Meſentery hinder Nutrition. 10
The Aliment of a Nurſe quickly turn'd into Milk. 11
Nutrition not proportional to the Quantity of Aliment. ib.
The Aliment enters into the Blood by ſeveral other Paſſages, beſides the Thoracick Duct. 12
Thin and liquid Aliment refreſheth the Spirits the ſooneſt. ib.

CHAP. II.

Obſervations drawn from the Circulation of the Chyle with the Blood. 12
Chyle cannot paſs through the ſmalleſt Veſſels of an Animal Body in a healthy State. ibid.
The Lungs the firſt and chief Inſtrument of Sanguification, the Mechaniſm of this Action explain'd. 13
Faulty Lungs hinder Nutrition. 14

The Neceſſity of ſuch as have faulty Lungs taking ſmall Quantities of Aliment at a time. 15
Why the Lungs are ſo ſenſible of Acrimony in Aliment. ibid.
How good Air aſſiſts Digeſtion. ib.
The Chyle not perfectly aſſimilated into Blood by its Circulation through the Lungs. 16
The Mechaniſm of Nature in converting the Chyle to Animal Juices during its Circulation with the Blood through the Body. ib.
Good Blood and a due Degree of projectile Motion, neceſſary for converting the Chyle into Animal Subſtances. 17
The Strength of the Aliment ought to be proportional to the Strength of the ſolid Parts. ibid.
The extreme Tenuity of the Aliment before it can ſerve the Animal Purpoſes. ib.
Hence the Inconveniencies of Viſcidity and Acrimony of Aliment. 18
The Neceſſity of Reparation of the Fluids and Solids of an Animal Body. ib.
The Quantity of real Solids in an Animal very ſmall, that they proceed from the Brain and Spinal Marrow. 19
The manner of Nutrition, and Accretion of the ſolid Parts explain'd. ib.
An Animal, the nearer to its Original, has the more Channels through which the Fluids paſs. 20
Hence ſome practical Rules for Diet according to the different Stages of Life. ibid.
The nutritious Juice of an Animal reſembles the White of an Egg, and the Heat proper for Nutrition equal to that from the Incumbation of a Hen upon her Eggs. 21
The Neceſſity of the frequent Repetition of Aliment, the bad Effects of long Abſtinence and the manner how ſtarving kills an Animal. 22
Why an Animal may ſubſiſt long upon mere Water. ib.

CHAP. III.

Obſervations drawn from the Nature and moſt ſimple Analyſis of vegetable Subſtances. 23

All Animals made immediately or mediately from vegetable Subſtances. ib.

Vegetables proper to make or repair Animal Subſtances ib.

The Aliment of Vegetables. The Diverſity of Juices of the ſeveral Parts of Vegetables, and the Variety of Juices taken in a Plant which is eaten raw. 24

The Mechaniſm of Plants ſeems to be more various than that of Animals. 25

In what the ſpecific Qualities of Plants reſide. ib.

The Effects of the ſeveral Ingredients of Plants upon Human Bodies. ibid.

Taſtes, the Indexes of the Ingredients of Plants. 26

Plants have different Effects as they are Acid or Alkaline. 27

Of the Qualities of the ſeveral Kinds of Alimentary Vegetables, particularly of the farinaceous or mealy Kind. ib.

Fermentation renders mealy Subſtances more eaſy of Digeſtion. 28

The Qualities of ſeveral Sorts of Fruits, Leaves, Stems, Roots of Alimentary Vegetables. ib.

The Ingredients into which Vegetables reſolve themſelves by the moſt ſimple Operation of Cookery and Chymiſtry. 30

Vegetable Emulſions. ib.

Vegetable Putrefaction. ib.

Of the fragrant Spirit of Vegetables. ib.

The Virtues of Infuſions, Decoctions, Gellies, Rob-extracts, expreſs'd Juices, and eſſential Salts of Vegetables. 31

The volatile Parts of Plants loſt by Cookery. 32

The vaſcular or ſolid Parts of Plants incapable of change in an Animal Body. 33

Fermentation of Vegetables. ib.

CHAP.

CHAP. IV.

Obſervations from the Nature and moſt ſimple Analyſis of Animal Subſtances. 33
Account of the Conſtituent Parts of Animal Subſtances. 34
Animal Solids, what? ib.
Blood the univerſal Juice from which the reſt are deriv'd. 35
The characteriſtick Differences of Animal and vegetable Subſtances, conſider'd as Aliment. ib.
Of the exhaling volatile Oil, or Spirit of Animals. 35
Of the Water contain'd in Animal Subſtances. 36
Of Animal Salts. ib.
Of Animal Oils. ib.
Animal Nouriſhment depends on the Food and manner of living of the Animal from which it is taken. 37
Animal Aliment more eaſily tranſmutable into Animal Subſtances than Vegetable. ib.
Fiſh Diet, its Effects. ib.
The different Qualities of Animal Food according to the Age, Element, Diet, &c. *of the Animal.* 38
Of the Qualities and moſt ſimple Analyſis of Animal Subſtances. 39
Animal Fluids in a ſound State, neither Acid nor Alkaline. ib.
Experiments upon Milk, Urine, the White of an Egg, Serum of the Blood, Bones and Animal Solids. ib.
Experiments on Human Urine, its Nature. 42
Experiments of the Mixture of ſeveral Alkaline and Acid Subſtances with the Serum of the Blood. 46

CHAP. V.

Of the Effects of different Alimentary Subſtances upon the Fluids and Solids of a Human Body. 50
Alimentary Subſtances when they have enter'd the Blood, are not intirely diveſted of their original Qualities. ib.
The ſmall Activity of Alimentary Subſtances compenſated by their Quantity. 50

Their Medicinal Qualities to be conſider'd in this Subject. 50
Enumeration of the ſeveral Actions upon the Fluids and Solids of a Human Body. 51
As by ſtimulating, contracting, relaxing the Solids, conſtipating the Capillary Tubes. ib.
Upon the Fluids by diminiſhing or increaſing their Quantity. ib.
Altering their Qualities by attenuating and condenſing; rendring them mild or acrimonious. ib.
Coagulating and diluting, increaſing or diminiſhing their projectile Motion. ib.
That the Fluids and Solids of a Human Body are capable of thoſe Alterations, may be demonſtrated by ocular Inſpection when they are open'd by a Wound or Sore. 52
Enumeration and Explanation of the Effects of the ſeveral Kinds of Alimentary Subſtances. ib.
Of ſuch as act with ſmall Force upon the Solids ib.
Great changes produced in a Human Body by ſtimulating the Solids. Of Alimentary Subſtances which ſtimulate. 53
Of Alimentary Subſtances which contract the Solids. ib.
The bad Effects of fermented Spirits of Aliment which relaxeth the Solids; nothing taken as Aliment has the Quality of totally obſtructing the Capillary Tubes 55
Of the Effects of ſeveral Sorts of Aliment upon the Fluids. ib.
Of Aliment attenuating. 55
Of Aliment thickening. 56
Denſity a good Quality of Blood, which is increas'd by Labour. ib.
The Qualities of ſound Blood. ib.
Of the ſeveral Sorts of Acrimony. ib.
Of Aliment anti-acid. 57
Of Acrimony alkaline, Aliment which ſubdues it, Aliment demulcent oppoſite to both acid and alkaline Acrimony. ib.

The Effects of increaſing or diminiſhing the projectile Motion of the Blood in producing of Acrimony. 57
Of diluting. 58
Of Coagulating the Fluids. 59
Of increaſing and diminiſhing the Quantity of Fluids. ib.
Of Aliment pectoral. Lenitive. 60
Of Diureticks. 61
Of Sudorificks. ib.
What increaſeth and diminiſheth inſenſible Perſpiration ib.
Of Aliments heating and cooling. 63
Cephalick. Cordial. ib.
Carminative. 64
The Qualities of Coffee, Tea and Chocolate. ib.

CHAP. VI.

Of the different Intentions to be purſued in the Choice of Aliment according to different Conſtitutions. 67
Enumeration of the ſeveral Sorts of Conſtitutions. 68
The Cauſes and Symptoms of lax Fibres, and the proper Diet for ſuch Conſtitutions. 69
The Cauſes and proper Diet of too ſtrong and elaſtick Fibres. 72
The Cauſes and proper Diet of plethorick Conſtitutions. 75
Of ſanguineous Conſtitutions. ib.
Of acid Conſtitutions. 78
Of ſuch as abound with a ſpontaneous Alkali. 81
The proper Diet for the muriatick Scurvy. 84
The Cauſes, Symptoms, and proper Diet of phlegmatick Conſtitutions. ib.
Of too great Fluidity. 87
The Cauſes, Symptoms and proper Diet of oily or fat Conſtitutions. ib.
Of the Quantity of Aliment in general. 90
The Cauſes, Symptoms and proper Diet of melancholick or atrabilarian Conſtitutions. 93

General Inferences from the foregoing Doctrine relating to the Aliment of Human Creatures in the ſeveral Stages of Life. 95

The bad Effects of Exceſs in ſeveral Sorts of Aliment. 97

General Rules about the Choice of Aliment, without regard to particular Conſtitutions, abſurd. 98

The different Effects, Advantages, and Diſadvantages of Vegetable and Animal Aliment explain'd. 99

That both Sorts are proper for Mankind. 100

Proofs from Anatomy, that Human Creatures are Carniverous. ib.

The Conformity of the Doctrine of this Eſſay to that of Hippocrates. 102

AN EXPLICATION OF SOME WORDS IN THIS ESSAY.

A

Abſorbent, that ſucks in a Liquid.

Æquilibrium, equal Weight, Force or Balance.

Alimentary Duct, the whole Paſſage of the Aliment from the Mouth to the Anus.

Anodine, abating Pain.

Aorta, the great Artery which proceeds from the left Ventricle of the Heart, and carries the Blood thro' the Body.

Atrophy, decay.

B.

Bronchia, the Air-Pipes of the Lungs.

C.

Carminative, diſpelling Wind.
Cacochymy, Redundance of ill Humours.
Caput mortuum, the thick Matter which remains after Diſtillation.
Chronical Diſeaſe, that does not kill ſoon.
Coagulum, a Curd.
Contraindication, when a Remedy is proper and improper for different Reaſons.
Conical, in the form of a Sugar-loaf tapering and diminiſhing by Degrees.
Cylindrical, like a Drum equally wide.
Cyſtick, belonging to the Gall-Bladder.

D.

Defrutum, Wine ſodden to a thick Conſiſtence.
Demulcent, mild, abating Acrimony.
Depletion, emptying.
Duodenum, the firſt of the Guts.

E.

Ebullition, boiling.
Elaſtick, ſpringy.
Elaſticity, Springineſs.
Eluted, cleanſed, waſh'd away.
Emetick, vomitory.
Emiſſary, that throws out a Liquid.
Ephemera, a Fever that laſts but one Day.
Eructation, belching.
Evaneſcent, vaniſhing, or growing extremely ſmall.
Exudes, ſweats out.

F.

Fœtid, ſtinking.

H

Hepatick, from the Liver.
Hydraulicks, raiſing or forcing of Water thro' Pipes.

I.

Ichor, a watery Humour flowing from Ulcers.
Immeability, what renders unpaſſable.
Incubation, hatching of an Egg.

L.

Lacteals, Veſſels which carry the Chyle thro' the Meſentery.
Lixivium, a Lye or a Solution of ſome fixed in Water.
Leucophlegmatick, pale and phlegmatick, bloated.

M.

Membrana adipoſa, a Membrane which contains the Fat.
Maſtication, chewing.
Meſentery, a membranous Part in the middle of the lower Belly, to which the Guts are connected.
Mucus, Snot.

N.

Nidoroſe, with the Flavour of ſomething hot or burnt.
Narcotick, cauſing Sleep, ſtupifying.

O.

Omaſus, one of the Stomachs of a ruminating Animal.
Omentum, the Caul.

P.

Pancreas, Sweet Bread, a large Salivary Gland in the lower Belly.
Papillous, like a ſmall Nipple.
Parotids, Glands behind the Ear.
Periſtaltick, alternate Motion of the Contraction and Dilatation of the Guts, commonly tending downwards.
Plethora, Fulneſs.

R.

Ramification, branching.
Repletion, filling, Fulneſs.

S.

Sapa Rob Extract, Juices boil'd and evaporated to ſeveral Degrees of Conſiſtence.
Sanguification, making of Blood.
Siliquoſe, that has Pods.
Sphincter, a Muſcle which ſhuts up any Cavity of the Body.
Stimulus, what irritates.
Styptick, binding.
Subclavian Vein, a Vein which paſſeth under the Collar-bone.
Suppuration, gathering of Matter, ripening of a Boil.

T.

Tetrapetalous, Flowers that have four Leaves.
Thoracick Duct, a Canal through which the Chyle paſſeth from the Lacteals into the Blood.
Tophaceous, chalky, gritty.

V.

Villous, douny, with a Pile like Velvet.
Viſcidity, a ſticking or gluiſh Quality.

THE
EXPLANATION
OF SOME
CHYMICAL TERMS.
Uſed in the following
ESSAY.

AS the following Treatiſe is chiefly deſign'd for Perſons not bred up in the Profeſſion of Phyſick, it is neceſſary to give a general Notion of the meaning of ſome Chymical Words that frequently occur in it.

The Principles of Natural Bodies according to the Chymiſts, are Water, Earth, Oil, Salt, Spirit, of all which every one has ſome general Notion; but the Diverſity of the Names and Qualities of Salts and Spirits occaſions ſome Confuſion in the Minds of ſuch as are ignorant of Chymiſtry.

The Chymiſts define Salt from ſome of it's Properties, to be a Body fuſible in the fire, congealable again by Cold into brittle Glebes or Chryſtals, ſoluble in Water ſo as to diſappear, not malleable and having ſomething in it which affecteth the Organs of Taſte with a Senſation of Acrimony or Sharpneſs. Of Native Salts there are,

Firſt, Sea-Salt and Sal Gemmæ, or Rock-Salt, which are of the ſame Nature. The firſt in all appearance being a Solution of the Second in the Water of the Ocean; theſe two are perfect Salts, fixt, and immutable by any Power in Animal Bodies; for the other Salts are never found in the Urine of any Animal that ſwallows them down, but Sea-Salt is always found in the Urine of every Animal that takes it, and in no other.

Secondly, Sal Nitre, or Sal Petre, which is more eaſily diſſolv'd by Fire, and leſs eaſily by Water than any other Salt, it is cold and affects the Tongue like a ſaltiſh Ice: It ſeems to be of a middle Nature between Foſſile and Animal, being producible from Animal Excrements intermix'd with vegetable Salts.

Thirdly, Sal Ammoniac of two Sorts, the ancient deſcrib'd by *Pliny* and *Dioſcorides* no more to be found: And the Modern which is a Compound of Foſſile, Animal and Vegetable Salt. This Salt cools Water, it is fix'd in a gentle Fire and ſublimes in a great one, its Taſte is quicker than that of common Salt reſembling that of Urine.

Fourthly, Borax, a Foſſile Salt of a ſweetiſh Taſte, it promotes the Fuſion of Metals.

Fifthly, Alum, which tho' no pure Salt, has moſt of the Properties of Salts, being ſoluble in Water, *&c.*

Salts are divided into Acid and Alkaline: Of Acid or Sour, one has a Notion from Taſte; Sourneſs being one of thoſe ſimple Ideas, which one cannot more plainly deſcribe. What being mix'd with an Acid, cauſeth an Efferveſcence, is call'd an Alkali.

Efferveſcence in the Chymical Senſe, ſignifies an inteſtine Commotion, produced by mixing two Bodies together, that lay at reſt before; attended ſometimes with a hiſſing Noiſe, Froathing and Ebullition: For Example, let us place in the firſt Claſs, Acids as Vinegar, Juice of Lemons, Juice of Oranges, Spirit of Nitre, Spirit of Alum: In the ſecond Claſs, other Saline Subſtances obtain'd from Animals and Vegetables, by Diſtillation, Putrefaction, Calcination, as Spirit of Urine, Spirit of Hartshorn, Salt of Tartar; becauſe the Subſtances of the ſecond Claſs, being mix'd with the Subſtances of the firſt raiſe an Efferveſcence, they are call'd Alkalis. There is a third Claſs of Subſtances, commonly call'd Abſorbents, as the various Kinds of Shells, Coral, Chalk, Crabs-eyes, *&c.* Which being mix'd with the firſt Claſs, likewiſe raiſe an Efferveſcence, and are therefore call'd Alkalis, tho' not ſo properly; for they are not Salts and have nothing common with the ſecond Claſs, except this Quality of fermenting with Acids.

It is obſervable that a violent Cold, as well as Heat may be produc'd by this Ebullition; for if Sal Ammoniac, or any pure volatile Alkali diſſolv'd in Water be mix'd with an Acid; an Ebullition with a great Degree of Cold will enſue, therefore, I think (with leave of the Chymiſts) Efferveſcence not ſo proper a Word to expreſs this inteſtine Motion. There is another Criterion of Acid and Alkali by the Change of Colour, which they produce in ſome Bodies; for Example, thoſe Liquors, which being pour'd to the Syrup of Violets turn it red, are Acids; thoſe which change it into a green Colour, are reckon'd Alkalis. Thus Oil of Vitiol turns Syrup of Violets red, and Oil of Tartar green.

The Word Alkali, comes from an Herb call'd by the *Egyptians*, Kali. This Herb they burnt to Aſhes, boild them in Water; and after having evaporated the Water, there remain'd at the bottom a white Salt, this they call'd Sal Kali, or Alkali. It is corroſive, producing Putrefaction in Animal Subſtances, to which it is apply'd.

Subſtances which are not perfectly Acid, but naturally turn ſo, I call Aceſcent. Subſtances which are not perfectly Alkaline but naturally turn ſo, I call Alkaleſcent.

Theſe are not Qualities in Bodies merely imaginary, but have very different and contrary Effects upon Human Bodies.

Salts which are neither Acid nor Alkaline, are call'd Neutral, ſo are Sal Ammoniac, Sea-Salt, Sal Gemmæ, Borax, Alum, Nitre, which as long as they retain their Saline Quality, are neither Acid nor Alkaline. But the Chymical Products of them all (except Sal Ammoniac) are generally Acid.

Fix'd Salts are ſuch as ſuſtain the Fire without flying away.

Volatile Salts fly away with a ſmall Heat, affecting the Noſe with an urinous Smell.

There are volatile and fix'd Alkalis.

The eſſential Salts of Plants are ſuch as ſhoot upon the Sides of the Veſſels, which contain their expreſs'd Juices.

In Diſtillations what trickles down the Sides of the Receiver in certain unctious Rivulets, if it will not mix with Water, it is call'd Oil, if it will mix with Water, it is call'd Spirits; Spirits are either inflammable, or not inflammable. The laſt either Acid, or Alkaline. Alkaline Spirits, are ſubtle volatile Liquors that run in Veins down the Sides of the Receiver in Diſtillations, which will not take Fire, mix with Water, and contain ſome Alkaline Salt, as Spirit of Harts-horn. Such are obtain'd from all the Parts of Animals, from all Plants by Putrefaction, and from the pungent Kind, as Muſtard, Horſe-Radiſh, *&c.* without it. Acid Spirits are ſubtile Liquors which come over in Diſtillations, not inflammable, miſcible with Water, ſuch are obtain'd from Vegetables diſtill'd with Water, and likewiſe from Foſſils; inflammable Spirits are ſubtle volatile Liquors which come over in Diſtillations, miſcible with Water, and wholly combuſtible; ſuch Spirits are obtainable from Plants by a previous Fermentaton, and not without it. By the Spirit of a Plant or that of an Animal, we underſtand that pure elaborated Oil, which by reaſon of its extreme volatility exales ſpontaneouſly, in which the Odour or Smell conſiſts.

Soap is a Mixture of a fix'd Alkaline Salt and Oil, in common Uſe its Virtues are cleanſing, penetrating, attenuating and reſolving. Any Mixture of any oily Subſtance with Salt may be call'd a Soap.

Bodies of this Nature are call'd Saponaceous.

He who would ſkilfully treat of the Nature and Choice of different Sorts of Aliment, ought to draw his Obſervations from the following Particulars. *Firſt*, from the Alterations which the Aliment undergoes in its Paſſage into the Blood. *Secondly*, From the Alteration it undergoes during its Circuation with the Blood. *Thirdly*, From the Nature nd moſt ſimple Analyſis of Vegetable Subſtances.

Fourthly, From the Nature and moſt ſimple Analyſis of Animal Subſtances. *Fifthly*, He ought to treat of the Effects of different Sorts of Alimentary Subſtances upon the Fluids and Solids of a Human Body. *Sixthly*, Of the different Intentions to be purſued in the Choice of Aliment in different Conſtitutions. Tho' I have neither Time, Ability, nor Obſervations ſufficient to handle thoſe Particulars ſo fully as they deſerve, I hope at leaſt to give a Specimen how they ought to be treated.

This is agreeable to the Doctrine of *Hippocrates*, who tells you in his firſt Book of Diet, that to write duly upon it, one muſt underſtand the Nature of Aliment, and of the Perſon it is given to.

For the Eaſe of the Reader, I have ſet down every thing in diſtinct Propoſitions with Inferences and Obſervations; the firſt in *Roman*, the other in common Numbers.

AN ESSAY CONCERNING

The Nature of Aliments, and the Choice of them, according to the different Conſtitutions of Human Bodies.

CHAP. I.

Obſervations drawn from the Alterations which the Aliment undergoes in its paſſage into the Blood.

PROP. I.

MASTICATION is a very neceſſary Preparation of ſolid Aliment, without which there can be no good Digeſtion. By chewing, ſolid Aliment is divided into ſmall Parts; in a human Body, there is no other Inſtrument to perform this Action, but the Teeth. By the Action of chewing, the Spittle and Mucus is ſqueez'd from the Glands, and mix'd with the Aliment, which Action if it be long continued, will turn the Aliment into a ſort of Chyle. The Spittle is an active Liquor, immediately deriv'd from the arterial Blood. It is ſaponaceous, as appears by its froathing, and likewiſe by diſtillation, and conſequently is attenuating, reſolving, penetrating, and de-

deterging. After long Abſtinence, it is extremely acrid, and copious, it ferments with the Juices of Vegetables, and conſequently diſpoſeth them to be chang'd into inflamable Spirits, it diſcovereth its Virtues in ſeveral Chirurgical uſes. Beſides, in the action of chewing, the Mucus (which is an Humour different from the Spittle, and by its Viſcidity collects Air) mixeth with the Aliment, and helps to attenuate it. The neceſſity of Saliva or Spittle to diſſolve the Aliment, appears from the contrivance of Nature in making the ſalivary Ducts of Animals, which ruminate or chew the Cud, extremely open. Such Animals as ſwallow their Aliment without chewing, want ſalivary Glands; and Birds have them placed in their Maw. There are inſtances of Men who ſwallow'd their Meat whole, but ruminated or chew'd the Cud afterwards. (Rumination is given to Animals to enable them at once to lay up a great ſtore of Food and afterwards to chew it.) And Animals ruminate more upon Hay than Graſs, the Food being harder. From all which Obſervations it appears, that the Solution of the Aliment by Maſtication is very neceſſary; and that without it the Aliment could not be duly diſpoſed; for the other changes which it receives as it paſſeth through the Alimentary duct.

Firſt, A great loſs of Spittle cauſeth a decay of Appetite. This has been confirm'd by Experience in ſeveral, who have made it their conſtant cuſtom to chew Maſtick; chewing and ſmoaking of Tobacco is only good in phlegmatick People.

Secondly, The humour of Salivation is not properly Spittle, but putrified Blood.

Thirdly, The depravation of the Inſtruments of Maſtication, by a paralytical diſpoſition, or by the want of Teeth, as in old Men and Infants, is a natural Indication of a liquid Diet, as of Milk and Broaths, and even ſuch of them as take Solids ought to chew in order to make an expreſſion of the Spittle.

PROP. II.

The Change which is made of the Aliment in the Stomach, is effected by Attrition of the ſolid Parts, or inward Coat of the Stomach, and the action of a diſſolvent Liquor aſſiſted with Heat.

The Liquor in the Stomach conſiſts of that which is ſeparated from its inward Coat; of the Spittle, which is almoſt continually ſwallow'd, and the Liquor which diſtills from the Gullet. By the help of this Liquor, and the conſtant Attrition of the ſolid Parts, the Aliment is diſſolv'd by an Operation reſembling that of making an Emulſion, in which Operation the oily parts of Nuts and Seeds being gently ground in a Marble Mortar, and gradually mix'd with ſome watery Liquor, are diſſolv'd into a ſweet, thick, turbid milky Liquor, reſembling the Chyle in an Animal Body. That the Stomach in Animals levigates the Subſtances, which it receives, is evident from the Diſſection of ſome Animals which have ſwallow'd Metals, which have been found poliſh'd on the ſide next the Stomach. Birds being without Teeth to make the firſt preparation of their Aliment, have ſtrong and nervous Stomachs, to make this Attrition the ſtronger; and this Motion in them hath been both ſeen and heard. The Rugæ or Plyes of the inward Coat of the Stomach contribute to the detaining the Aliment in the Stomach. The Heat in Land Animals helps likewiſe to the Solution of the Aliment, but not much, for Fiſhes have a ſtrong Digeſtion without it, tho' by the tryal of the Thermoſcope, they have more Heat than the Element which they ſwim in. It has been ſhow'd before that the Spittle is a great Diſſolvent, and there is a great quantity of it in the Stomach, being ſwallow'd conſtantly, at leaſt in Sleep. He who eats a Pound of Bread ſwallows at leaſt as much Spittle as Bread. This Liquor of the Stomach in a ſound ſtate is not Acid, for it has been found by Experiments, that Pearls have paſs'd through Cocks and Hens undiſſolv'd.

1. The Liquor of the Stomach, which with faſting grows extremely Acrid, and the quick ſenſation of the inward villous Coat of the Stomach, ſeem to be the Cauſe of the Senſe of Hunger.

2. Such as have, by the uſe of ſpirituous Liquors, weaken'd and deſtroy'd ſome of the ſolid parts of the Stomach, cannot recover a right Digeſtion, for this inward villous Coat when deſtroy'd cannot be reſtor'd.

3. This Liquor of the Stomach may (by reaſon of ſome ſaline Acrimony) be made of ſome determined quality, and affect human Creatures with Appetites of other Animals, which in that caſe they can take without hurt; or it may likewiſe occaſion an exorbitant Appetite of uſual things, which they will take in ſuch quantities till they vomit it up like Dogs, from whence it is call'd Canine; in the firſt caſe the Organs of Taſte are vitiated; both Diſeaſes are cur'd by Diet, oppoſite to this Acrimony, whether Alkaline, Acid or Muriatick.

4. Thirſt and Hunger denote the ſtate of the Spittle, and Liquor of the Stomach. Thirſt is the ſign of an Acrimony commonly Alkaleſcent or Muriatick.

5. A Paralytical diſpoſition of the Nerves of the Stomach, a deprav'd condition of the Liquor of the Stomach, ſomething viſcous, fat and oily remaining there, deſtroys the Senſation of Hunger.

6. The Action of the Stomach is totally ſtopp'd by too great Repletion, in which caſe both the Orifices of the Stomach by a neceſſary Mechaniſm cloſe, and neither will admit nor expel any thing. In which caſe relaxing, as by warm Water, is the only proper Expedient.

The Signs of the Functions of the Stomach being deprav'd, are Pains in the Stomach many Hours after Repaſt; Eructations either with the Taſte of the Aliment Acid, Nidoroſe, or Fœtid, reſembling the Taſte of rotten Eggs; Inflations, or the Senſation of Fulneſs; Sickneſs, Hickup, Vomiting, a Fluſhing in the Countenance, Foulneſs of the Tongue. In general, whatever be the State of the Tongue, the ſame is that of the inward Coat of the Stomach. When the Taſte of the Mouth is bitter, it is a Sign of a Redundance of a bilious Alkali, and demands a quite different Diet from the caſe of Acidity or Sowerneſs.

PROP. III.

By Digeſtion in the Alimentary Duct the ſpecifick Difference of all Subſtances is aboliſh'd, and the whole Action reſembles Putrefaction.

Digeſtion is a Fermentation begun, becauſe there is all the Requiſites of ſuch a Fermentation, Heat, Air and Motion, but it is not a compleat Fermentation, becauſe that requires a greater Time than the Continuance of the Aliment in the Stomach. Vegetable Putrefaction reſembles very much Animal Digeſtion. Vegetable Putrefaction is produced by throwing Green ſucculent Vegetables in a Heap in open warm Air, and preſſing them together, by which all Vegetables acquire, *Firſt*, A Heat equal to that of a Human Body. *Secondly*, A putrid ſtercoraceous Taſte and Odour, in Taſte reſembling putrid Fleſh, and in Smell Human Fœces. This putrid Matter being diſtill'd, affords, *Firſt*, A Water impregnated with an urinous Spirit, like that obtainable from Animal Subſtances, which Water is ſeparable into Elementary Water, and a volatile Animal Salt. *Secondly*, A volatile oily Alkaline Salt. *Thirdly*, A volatile thick Oil. *Fourthly*, The Remainder being calcin'd affords no fixt Salt; in ſhort, every thing happens as if the Subject had not been Vegetable, but Animal. Putrefaction utterly deſtroys the ſpecific Difference of one Vegetable from another, converting them into a pulpy Subſtance of an Animal Nature: Making the ſame Alteration very near as if the Vegetable had gone through the Body of a ſound Animal, for tho' ſuch an Animal ſhould entirely live upon Acids, no Part of its Body affords any acid fix'd Salt. * This is ſo far true, that even the Herbs taken out of the *Omaſus* of ruminating Animals afford the ſame Contents as putrified Vegetables. But tho' this Action of Putrefaction comes the neareſt to Animal Digeſtion, it ſo far differs from it, that the Salts and Oils are only detain'd in the Animal Body ſo long as they remain benign and friendly to it; but as ſoon as they putrefy intirely, are either thrown off, or muſt produce mortal Diſtempers.

PROP. IV.

The Gall is the principal Diſſolvent of the Aliment, and when it is peccant or deficient, there can be no right Digeſtion.

The Bile is of two Sorts, the Cyſtick or that contain'd in the Gall-Bladder, which is a ſort of Repoſitory for the Gall, and the Hepatick or what flows immediately from the Liver. The Cyſtick Gall is thick and intenſely bitter, ſo that one Drop of it will make a whole Pint of Water bitter. The Hepatick Gall is more fluid and not ſo bitter. There is no other bitter Humour in a Human Body, beſides Gall, except the Wax of the Ear. The Gall is not a perfect Alkali, for it does not ferment with an Acid, but it is Alkaleſcent, entirely oppoſite to Aceſcents, and ſoon corruptible, and convertible into a Corroſive Alkali. It is a ſaponaceous Subſtance, being compos'd of an Alkaline Salt, Oil and Water, all which can be extracted from it. The Bile, like Soap, takes out Spots from Wool or Silk, and the Painters uſe it to mix their Colours; by this ſaponaceous Quality, it mixeth the oily and watery Parts of the Aliment together.

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* *Vide* Philoſophical Tranſactions.

ther. But tho' the Bile be an Oil, it is not combuſtible till dry. Theſe Qualities make it a moſt powerful and proper Diſſolvent, which appears by Experience. The Milk in the Stomach of Calves, which is coagulated by the Runnet, is again diſſolv'd, and rendered fluid by the Gall in the *Duodenum*. Voracious Animals, and ſuch as do not chew, have a great Quantity of Gall, and ſome of them have the Biliary Duct inſerted into the *Pylorus*. It is likewiſe the chief Inſtrument (by its Irritation) of the periſtaltick Motion of the Guts. Such as have the Bile peccant or deficient are reliev'd by Bitters, which are a ſort of ſubſidiary Gall. The learned *Boorhaave* has found the Gall of an Eel, which is moſt intenſely bitter, a moſt effectual Remedy in ſuch Caſes. The common Symptoms of the Excretion of the Bile being vitiated, are a yellowiſh Colour of the Skin, white hard Fœces, a Loſs of Appetite, a lixivial Urine.

PROP. V.

The Bile is ſo acrid, that of itſelf it could not be admitted into the Lacteal Veſſels. Therefore Nature has furniſh'd another Humour, *viz.* the pancreatick Juice to temper its Bitterneſs and Acrimony, after it has done its Office.

The Pancreas is a large ſalivary Gland ſeparating about a Pound of an Humour like Spittle, in twelve Hours. The Bile mix'd with Spittle loſeth its Bitterneſs in time, and even Wormwood eat with Bread will do ſo, becauſe it is mix'd with a great Quantity of Spittle. The pancreatick Juice likewiſe mixeth the Parts of the Aliment rendring the Chyle Homogeneous. When the Bile is not ſeparated in the Liver the Fœces are white, but this is not occaſion'd by the Mixture of the pancreatick Juice.

PROP VI.

Acrimony and Tenacity are the two Qualities in what we take inwardly moſt to be avoided.

The papillous inward Coat of the Inteſtines is extremely ſenſible, and when the Acrimony is ſo great as to affect the ſolid Parts, the Senſation of Pain is intolerable. The periſtaltick Motion of the Guts, and the continual Expreſſion of the Fluids, will not ſuffer the leaſt Matter to be apply'd to one Point the leaſt inſtant of Time; for the ſmalleſt quantity of Turpentine or Pitch will ſtick to the Fingers, but not to the Guts. But this Motion in ſome Human Creatures may be weak in reſpect to the Viſcidity of what is taken ſo as not to be able to propel it, the conſequence of which is dangerous, and perhaps fatal to the Life of the Creature. Subſtances hard, cannot be diſſolv'd, but they will paſs; but ſuch whoſe Tenacity exceeds the Powers of Digeſtion will neither paſs nor be converted into Aliment. Beſides, the Mouths of the Lacteals may permit Aliment too acrimonious, or not ſufficiently attenuated, to enter in People of Lax Conſtitutions, whereas their Sphincters will ſhut againſt them in ſuch as have ſtrong Fibres. The Mouths of the Lacteals may be ſhut up by a viſcid *Mucus*, in which Caſe the Chyle paſſeth by Stool, and the Perſon falleth into an Atrophy.

1. Fat or Oil is neceſſary, as for Animal Motion ſo likewiſe for this periſtaltick Motion of the Inteſtines, and lean People often ſuffer for want of it, as fat People may by Obſtruction of the Veſſels. The *Omentum* will melt by ſtrong Motion, as has been found in Horſes by hard running.

2. This periſtaltick Motion, or repeated Changes of Contraction and Dilatation, is not in the Lower Guts, elſe one would have a continual needing to go to ſtool. Wind and Diſtention of the Bowels are Signs of a bad Digeſtion in the Inteſtines, (for in dead

Animals when there is no Digeſtion at all, the Diſtention is in the greateſt Extremity) and Diarhæas which proceed from Acrimony, Laxity of the Bowels or Obſtruction of the Lacteals.

PROP. VII.

The Mechaniſm of Nature in converting our Aliment into Animal Subſtances conſiſts chiefly in two Things. *Firſt*, By mixing conſtantly with it animal Juices already prepar'd. *Secondly*, By the Action of the ſolid Parts as it were churning them together. This is evident, if we conſider firſt the vaſt Quantity of *Saliva* mixed with the Aliment in chewing. He that eats a Pound of Bread mixeth it very near with as much Spittle, and this ſeparated from Glands that weigh only about four Ounces. Afterwards the ſame Aliment is mix'd with the Liquor of the Stomach, the Bile and Pancreatick Juice, and if we compute the Quantity of Bile and Pancreatick, from the Weight of theſe *Viſcera* in reſpect of the ſalivary Glands, we ſhall find ſtill a vaſtly greater Quantity of theſe animal Juices mix'd with the Aliment; this is not all, for when the Chyle paſſeth through the Meſentery, it is mix'd with the Lymph (which is the moſt ſpirituous and elaborated Part of the Blood) from the Glands of the Meſentery: So that the Juices of an Animal Body are as it were * cohobated, being excreted and admitted again into the Blood with the freſh Aliment; all the while the ſolid Parts act upon the Mixture of Aliment and Animal Juices ſo as to make the Mixture more perfect; beſides, none of theſe Juices except the Liquor of the Inteſtines, are mix'd with the Fœces of an Animal, which in a ſound State are hard. So that one may compute that a Pound of Bread before it enters the Blood, is mix'd perhaps with four times the

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* *i. e.* new diſtill'd.

Quantity of Animal Juices. The ſame Oeconomy is obſerv'd in the circulation of the Chyle with the Blood, by mixing it intimately with the Parts of the Fluid to which it is to be aſſimilated.

1. From whence it follows, that an Animal whoſe Juices are unſound or ſolid Parts weak can never be duly nouriſh'd, for unſound Juices can never duly repair the Fluids and Solids of an Animal Body, and without a due Action of the ſolid Parts, they never can be well mix'd. The Stomach, the Inteſtines, the Muſcles of the lower Belly, all act upon the Aliment; beſides, the Chyle is not ſuck'd but ſqueez'd into the Mouths of the Lacteals by the Action of the Fibres of the Guts: The Mouths of the Lacteals are open'd by the inteſtinal Tube, affecting a ſtreight inſtead of a ſpiral Cylinder. Thus it is plain, that the Chyle muſt be peccant in Quantity or Quality when theſe Actions and Organs are too weak, and whatever ſtrengthens the ſolid Parts muſt help the Digeſtion.

2. Diarhæas and ſtrong Purgations muſt ſpoil the firſt Digeſtion, becauſe of the great Quantities of Animal Liquids which they expel out of the Body; a vaſt Quantity and Variety of Animal Liquors are carried off by Purging, Air, Spittle, *Mucus*, all the Liquors that are ſeparated in the Glands of the Alimentary Duct, both Sorts of Bile, the pancreatick Juice, Lymph, and ſometimes Blood; computing the Quantity of theſe Secretions, makes it plain that the whole Juices may be carried off by purging, and when thoſe Liquors are expell'd out of the Body, which by their Mixture convert the Aliment into an Animal Liquid, this cannot ſo well be perform'd.

3. The periſtaltick Motion of the Inteſtines is the laſt that ceaſeth in an Animal Body, for it remains after the Motion of the Heart is ceas'd. By the Entry of the Chyle and Air into the Blood, by the Lacteals, the Animal may again revive.

The Obſtruction of the Glands of the Meſentery, is a great Impediment to Nutrition, for the Lymph in thoſe Glands is a neceſſary Conſtituent of the Aliment before it mixeth with the Blood, and for the ſame Reaſon young Animals are moſt and beſt nouriſh'd, for the meſenterick Glands are largeſt in the Vigour of Youth; in old Age they vaniſh, and are liable to Obſtructions. Therefore ſcropulous Perſons can never be duly nouriſh'd, for ſuch as have Tumors in the Parotids often have them in the Pancreas and Meſentery.

4. In tabid Perſons Milk is the beſt Reſtorative, for it is Chyle already prepar'd; if a Nurſe after being ſuck'd dry eats Broath, the Infant will ſuck the Broath almoſt unalter'd.

5. The Chyle by Reaſon of the Smoothneſs of its Particles is white, it grows more grey in the thoracick Duct where it ſtill retains the Flavour of the Aliment.

6. Animals which take a large Quantity of Aliment by the Mouth, may be leſs nouriſh'd, than thoſe that take a ſmaller, for according to the Force of the * chylopoœtick Organs, a larger or leſs Quantity of Chyle may be extracted from the ſame Quantity of Food.

Aſtriction of the Belly is commonly a Sign of ſtrong chylopoœtick Organs.

PROP. VIII.

The moſt ſubtile Part of the Chyle paſſeth immediately into the Blood by the abſorbent Veſſels of the Guts, which diſcharge themſelves into the meſeraick Veins; their Largeneſs and Number demonſtrate this, for they are numerous and vaſtly larger than their correſpondent Arteries; beſides,

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* Which make the Chyle.

wherever there are Emiſſaries, there are abſorbent Veſſels, *ex. gr.* in the Skin, by the abſorbent Veſſels of which Mercury will paſs into the Blood.

Birds which have ſtrong and large Breaſts, ſmall Bellies, and their Ribs upon their Backs have no Lacteals nor thoracick Duct, and their Aliment paſſeth immediately into the meſeraick Veins. If one conſiders the Capacity of the thoracick Duct, and the Slowneſs of the Paſſage of the Aliment by the Lacteals through it, and at the ſame Time the great Quantity of ſome Liquors, as of chalybeat Water, which in ſome paſs in a ſmall Time by Urine; by an eaſy Calculation he will be able to demonſtrate that ſuch a Quantity could not paſs into the Blood by the thoracick Duct in ſo ſhort a Time.

Therefore when the Intention is to give an immediate Refreſhment to the Spirits, as after great Abſtinence and Fatigue, thin or liquid Aliment is the propereſt, and for the ſame Reaſon Chalybeat Waters ſeem to be a proper Remedy in Hypochondrical Caſes; their ſubtle and divided Particles are taken immediately into the Meſeraick Veſſels, and carried ſtreight into the Liver and Spleen.

CHAP. II.

Obſervations drawn from the Circulation of the Chyle with the Blood.

PROP. I.

THE Chyle of it ſelf cannot paſs through the ſmalleſt Veſſels (for it neither will paſs by Urine nor Sweat) therefore it cannot nouriſh the Animal, till it is converted into Blood; and it is converted into Blood by the Mechaniſm of Nature above deſcrib'd, *viz.* by intimately mixing it with the Particles of the Liquor, to which it is to be aſſimilated, as will appear by what follows.

PROP. II.

The Lungs are the firſt and chief Inſtrument of Sanguification.

The Chyle firſt mixeth with the Blood, in the ſubclavian Veins, and enters with it into the Heart, where it is very imperfectly mix'd, there being no Mechaniſm nor Fermentation by extraordinary Heat, *&c.* to convert it immediately into Blood, which is firſt effected by the Lungs. The Wind-pipe divides it ſelf into a great number of Branches call'd *Bronchia*, theſe end in ſmall Air-bladders dilatable and contractible, capable to be inflated by the admiſſion of Air, and to ſubſide at the Expulſion of it. The Pulmonary Artery and Vein paſs along the Surfaces of theſe Air-Bladders in an infinite number of Ramifications. A great number of thoſe Air-Bladders form what we call Lobuli, which hang upon the Bronchia, like bunches of Grapes upon a Stalk. Theſe Lobuli conſtitute the Lobes, and the Lobes the Lungs. Let us ſee what effect an Engine ſo contriv'd will have upon the crude mixture of Blood and Chyle; firſt, as the Blood and Chyle paſs through the Ramifications of the Pulmonary Artery, they will be ſtill more perfectly mix'd, a red Liquor, and a white Liquor paſſing through only one Tube, will both retain their Original Colours; but if this Pipe is divided into Branches, and theſe again ſubdivided, the red and white Liquors, as they paſs through the Ramifications, will be more intimately mix'd, and both Colours will be blended together; the more Ramifications, the mixture will be the more perfect; but this is not all, for as this mixture of Blood and Chyle paſſeth through the Arterial Tube, it is preſs'd by two contrary forces, that of the Heart driving it forward againſt the ſides of the Tube, and the elaſtick force of the Air preſſing it on the oppoſite ſide of thoſe Air-Bladders, along the ſurface of which (as was ſaid before) this Arterial Tube creeps. By thoſe two oppoſite forces, the parts of the Liquor are compreſs'd together, and as it were churn'd, and more intimately mix'd. Moreover by the alternate motion of thoſe Air-Bladders, whoſe ſurfaces are by turns freed from mutual contact, and by a ſudden Subſidence meet again by the ingreſs and egreſs of the Air; the Liquor is ſtill further attenuated, diſſolv'd, and chang'd into a homogeneous Fluid.

1. The force of the Air upon the Pulmonary Artery is but ſmall, in reſpect of that of the Heart, but it is ſtill ſomething, and whatever the effect of it be, it encreaſeth, and diminiſheth with the Gravity of the Air, to which the Elaſticity is proportional.

As to the admittance of the weighty and elaſtick parts of the Air into the Blood, through the Coats of the Veſſels, it ſeems contrary to Experience. The ſpumous and florid ſtate which the Blood acquires in paſſing through the Lungs, is eaſily accounted for, from its own Elaſticity, and the violent Motion before deſcrib'd: The Aerial Particles in the Blood and Chyle expanding themſelves. That the air in the Blood Veſſels has a communication with the outward Air, I think ſeems plain from the Experiments of Human Creatures being able to bear Air of much greater Denſity in diving, and of much leſs upon the tops of Mountains, provided the Changes be made gradually; otherwiſe the Air within the Veſſels being of a leſs Denſity, the outward Air would preſs their ſides together, and being of a greater Denſity, would expand them ſo as to endanger the Life of the Animal.

1. As much Blood paſſeth through the Lungs, as through all the reſt of the Body. The Circulation is quicker and Heat greater, and their Texture is extremely delicate; upon all which accounts they are

extremely ſenſible of any Force either from the too violent Motion or Acrimony of the Blood.

2. Since the Lungs are the firſt and chief Inſtrument of Sanguification, the Animal that has that Organ faulty, can never be duly nouriſh'd, nor have the Vital Juices, (which are all deriv'd from the Blood) in a good State; and this is true, underſtanding the Lungs only as an Inſtrument of Digeſtion, and abſtracting from an acrid and purulent Matter, that mixeth with the Blood in ſuch as have their Lungs ulcerated; therefore ſuch as have a faulty Circulation through the Lungs, ought to eat very little at a time, becauſe the encreaſe of the quantity of freſh Chyle muſt make that Circulation ſtill more uneaſy, which indeed is the Caſe of Conſumptive, and ſome Aſthmatick Perſons, and accounts for the Symptoms they are troubled with after eating. The great Rule of Diet for Conſumptive People, and upon which the whole Cure depends, is taking their Aliment in ſmall Quantities. It happens very often unfortunately for Aſthmatick Perſons that they have Voracious Appetites, and conſequently for want of a right Sanguification are often Leucophlegmatick.

3. The Choice as well as Quantity of Diet, is of great Importance to ſuch as have weak Lungs, for it was obſerv'd * that the Chyle in the Thoracick Duct retain'd the Original Taſte of the Aliment, which not being yet converted into Blood, and intirely ſubdued by Circulation, muſt operate upon the Lungs into which it enters in this Condition, according to its original qualities. The Lungs being the chief Inſtrument of Sanguification, and acting ſtrongly upon the Chyle to bring it to an Animal Fluid, muſt be reacted upon as ſtrongly.

4. Good Air aſſiſts the Digeſtion, as it is an Inſtrument of Sanguification in the Lungs.

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* Chap. I. Prop. VII. 5.

PROP.

PROP. III.

The Chyle is not perfectly aſſimilated into Blood by its Circulation through the Lungs, for it is known by Experiments of Blood-letting, that ſeveral Parts of it remain unmix'd with the Blood, ſwimming a top like an oily Subſtance, even eight Hours after repaſt, and no doubt this Digeſtion, as well as that through the Alimentary Duct, is different in different Subjects.

PROP. IV.

After the Chyle has paſs'd through the Lungs, Nature continues her uſual Mechaniſm to convert it into Animal Subſtances, during its Circulation with the Blood, *viz.* by intimately mixing the Parts of the Aliment, with theſe of the Animal Juices, by the action of the ſolid Parts.

The mixture of Blood and Chyle after its Circulation through the Lungs, being brought back into the left Ventricle of the Heart is drove again by the Heart into the Aorta, through the whole Arterial Syſtem, every Particle of the Body receives ſome Branch from the Aorta, except ſome of the ſolid Parts of the Liver. The Arteries are Elaſtick Tubes, endued with a Contractile Force, by which they ſqueeze, and drive the Blood ſtill forward, it being hinder'd from going backward by the Valves of the Heart. The Arteries are Conical Veſſels, with their Baſes towards the Heart, and as they paſs on, their Diameters grow ſtill leſs and leſs. The Celerity of the Motion diminiſheth by the encreaſe of the Friction of the Fluid, againſt the ſides of the Tubes. Without this Motion, both the Blood and the Chyle, would be converted into one ſolid Maſs, but on the contrary by the continuance of it, the Fluid being compreſs'd by the ſides of the Tube; eſpecially in the ſmall Veſſels, where the Points of Contact are more ; the Blood and Chyle are ſtill more intimately mix'd, and by Attrition or Friction attenuated, by which the mixture acquires a greater Degree of Fluidity, and Similarity or Homogenerety of Parts. Therefore,

1. Good Blood and a due Projectile Motion or Circulation, are neceſſary to convert the Aliment into laudable Animal Juices.

2. The Strength of the Aliment (by which I underſtand its Reſiſtance to the ſolid Parts) ought to be proportion'd to the Strength of the ſolid parts, and as Animals that uſe a great deal of Labour or Exerciſe, have their ſolid Parts more elaſtick and ſtrong, they can bear and ought to have ſtronger Food, too thin Nouriſhment being quickly diſſipated by the vigorous Action of the ſolid Parts.

3. The Defects of the firſt Concoction are not to be mended by the ſecond ; for if the Chyle paſſeth into the Blood in a bad State, as the force of Fibres, which contribute to the ſecond Digeſtion is limited, it is not ſufficient to convert a Peccant Liquor, into laudable Animal Juices.

PROP. V.

The Aliment as it circulates through an Animal Body, is reduc'd almoſt to an imperceptible tenuity, before it can ſerve the Animal Purpoſes.

The Blood in live Animals, conſiſts of red Globules, ſwimming in a Serum or watery Liquor. The ſmalleſt Veſſels which carry the Blood, or red Fluid by Lateral Branches ſeparate the next thinner Fluid or Serum, the Diameters of which Lateral Branches are leſs than the Diameters of the Blood Veſſels, and will not in a healthy State admit the red Fluid. Such may be call'd Serous Arteries. Thoſe Serous Arteries emit Lateral Branches which carry Lymph, a Liquor ſtill more Limpid than Serum, and from the Liquor which they carry may be call'd Lymphatick Arteries,

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tranſmitting their Liquor into the Lymphatick Veins, thoſe Lymphatick Arteries will not admit Serum. How far this progreſſion goes is not certain; ten capillary Arteries in ſome parts of the Body as in the Brain, are not equal to one Hair, and the ſmalleſt Lymphatick Veſſels are a hundred times ſmaller than the ſmalleſt Capillary Artery. What Mechaniſm is that which can attenuate a Fluid compounded of the Ingredients of Human Aliment, as Oil, Salts, Earth, Water, ſo as to make it flow freely through ſuch Tubes?

2. Hence one can eaſily perceive the inconveniency of Viſcidity which obſtructs, and Acrimony that deſtroys the Capillary Veſſels.

2. Obſtructions muſt be moſt incident to ſuch parts of the Body, where the Circulation and the Elaſtick force of the Fibres are both ſmalleſt, and thoſe are the Glands which are the extremities of Arteries form'd into Cylindrical Canals.

3. Hence too ſolid or viſcous Aliment is hurtful to ſcrophulous Perſons.

PROP. VI.

The Fluids and Solids of an Animal Body demand a conſtant Reparation.

An Animal in order to be moveable muſt be flexible, and therefore is fitly made of ſeparate and ſmall ſolid Parts replete with proper Fluids. The whole Body is nothing but a Syſtem of ſuch Canals, which all communicate with one another, mediately or immediately (for a Lymphatick Veſſel communicates with the Artery, by the intermediate Gland.) In this moveable Body the fluid and ſolid Parts, muſt be conſum'd by the muſcular Motion, and the perpetual Flux of the Liquids; a great part of which are thrown out of the Body by proper Emiſſaries, and the ſmaller Solids are likewiſe rubb'd off, mix'd with the Fluids, and in that form exhal'd. Therefore both Fluids and Solids demand a conſtant Reparation.

1. The Quantity of Solids not Morbid in an Animal Body is very ſmall, as appears by Atrophies, or Decays; and likewiſe by Microſcopes, thoſe Solids are entirely Nervous and proceed from the Brain, and Spinal Marrow, which by their bulk appear ſufficient to furniſh all the Stamina or Threads of the ſolid Parts. The Solids are originally form'd of a Fluid, from a ſmall Point, as appears by the gradual Formation of a Fœtus. The Solids and Fluids differ, only in the degree of Coheſion, which being a little encreas'd turns a Fluid into a Solid. How the Fluids are repair'd has been already explain'd. The Nutrition of the Solids is ſomewhat more obſcure.

PROP. VII.

Nutrition of the Solids is perform'd by the circulating Liquid in a due degree of tenuity in the ſmalleſt Vaſcular Solids.

The Fluids and Solids of an Animal Body, are eaſily tranſmutable into one another. The white of an Egg (a Fluid reſembling the Serum of the Blood, and of which a whole Animal is made) will coagulate and turn Solid by a moderate Heat, and the hardeſt of Animal Solids are reſolvable again into Gellys.

As the white of an Egg by Incubation, ſo can the Serum by the action of the Fibres be ſtill more and more attenuated. A Fluid moving through a flexible Canal, when the Canal grows extremely ſmall and ſlender, by its Friction, will naturally lengthen, and as it were Wire-draw, the Sides of the Canal, according to the Direction of its Axis, and as the Canal is lengthen'd or Wire-drawn, it grows ſtill ſmaller and ſlenderer ſo as that the evaneſcent ſolid and fluid ſcarce differing, the Extremities of theſe ſmall Canals will by Propulſion be carried off with the Fluid continually, and likewiſe continually repair'd and new ones made in their room. The Force of the Fluid will likewiſe ſeparate the ſmalleſt Particles which compoſe the Fibres ſo as to leave vacant Interſtices in thoſe Places where they coher'd before, which vacant Places will be again fill'd up by Particles carried on by the ſucceeding Fluid (as a Bank by the Mud of the Current) and which of courſe muſt be reduced to that Figure which gives the leaſt Reſiſtance to the Current, and conſequently muſt apply themſelves to the inward Surface of the Canal ſo as to preſerve the Tube, the Syſtem of Tubes that is the Animal entire.

1. Thoſe Tubes that are moſt recently made of Fluids are moſt flexible and moſt eaſily lengthen'd, ſuch Tubes as have often ſuffer'd this Force grow rigid, and hardly more extendible therefore.

2. An Animal the nearer to its Original, the more it grows.

3. To this Motion of Elongation of the Fibres is owing the Union or Conglutination of the Parts of the Body, when they are ſeparated by a Wound.

4. From the foregoing Doctrine it is eaſy to explain the Formation of the moſt ſolid Parts of the Body, for when the Fluid moves in ſeveral ſmall Veſſels, which by the Contact of their Sides ſtop the Current of the Fluid, thoſe Canals by Degrees are aboliſh'd and grow ſolid, ſeveral of them united grow a Membrane, theſe Membranes further conſolidated become Cartilages, and Cartilages, Bones; conſequently, an Animal the nearer it is to its Original, the more Pipes it hath, and as it advanceth in Age ſtill the fewer. Many of our Veſſels degenerate into Ligaments, the very Sutures of the Skull are aboliſh'd in old Age.

5. Many practical Rules may be drawn from the foregoing Doctrine, for the Diet of Human Creatures according to their different States of Life, and the Condition of the Solids, it is evident that the Diet of Infants ought to be extremely thin, ſuch as lengthens the Fibres without Rupture; but in a

young Animal, when the Solids are too Lax (the Caſe of rickety Children) the Diet ought to be gently Aſtringent.

The Aliment likewiſe ought to be different according to the State of the Solids, in Animals full grown: tho' an Animal arrives at its full Growth at a certain Age, perhaps it never comes to its full Bulk, till the laſt Period of Life. The *Membrana adipoſa* inveſts almoſt every Part of the Body, ſo that there is hardly any Fibre, but is ſheath'd with a Part of it. This Membrane ſeparates an oily Liquor call'd Fat, neceſſary for many Purpoſes of Life; when the Fibres are Lax, and the Aliment too redundant, great part of it is converted into this oily Liquor, all the ſuperfluous Weight of an Animal beyond the Veſſels, Bones and Muſcles is nothing but Fat; but the Converſion of the Aliment into Fat is not properly Nutrition, which is a Reparation of the Solids and Fluids, and Fat properly ſpeaking is neither. But I ſhall treat more particularly of theſe Subjects in their proper Place.

7. The Matter of Nutrition is moſt ſubtile, and Nutrition the laſt and moſt perfect Animal Action, to perform it by the foregoing Propoſitions, there muſt be a due Degree of projectile Motion, or Celerity of Circulation to which Attrition and Heat is proportional. The Heat equal to Incubation, is only nutritious; any thing leſs or more is inſufficient, and the nutritious Juice itſelf reſembles the White of an Egg, in all its Qualities. By too weak a Circulation the Aliment approacheth to theſe Qualities which it would acquire by a ſmall Degree of Heat without Motion, is viſcous imperfectly mix'd, and the Perſon in this Condition is ſubject to all the Accidents of a *Plethora*, by too ſtrong a projectile Motion the Aliment tends to Putrefaction is diſſipated; and the ſolid Parts inſtead of being repair'd are deſtroy'd. Hence may be deduc'd the Force of Exerciſe in helping Digeſtion, and likewiſe the Rules for regulating the

Times and Degrees of it. But thoſe are foreign to my Subject.

PROP. VIII.

The frequent Repetition of Aliment is not only neceſſary for repairing the Fluids and Solids of an Animal Body, but likewiſe to keep the Fluids from the putreſcent alkaline State, which they would acquire, by conſtant Motion, and Attrition, without being diluted, by a freſh Emulſion of new Chyle.

An Animal that ſtarves of Hunger dies feveriſh, and delirious as appears by Experiments upon Cats and Dogs, for the moſt fluid Parts are diſſipated, what remains turns alkaline and corroſive affecting the tender Fibres of the Brain. The moſt ſevere Orders of the Church of *Rome* who practiſe Abſtinence, feel after it fetid hot Eructations and Head-Aches. Long Abſtinence does not kill by want of Blood, for twenty Days faſting will not diminiſh its quantity ſo much as one great Hœmorage. An Animal can never die for want of Blood, while there is a quantity ſufficient for the continuity of the Preſſure, it makes, ſo apply'd to the Brain, as to produce Animal Spirits. Beſides the Diminution both of the Fluids and Solids in an Atrophy, is much greater than what can happen by being ſtarv'd. Therefore faſting kills by the bad State, not by the inſufficient quantity of Fluids.

Any watery Liquor will keep an Animal from ſtarving very long by diluting the Fluids, and conſequently keeping them from this alkaline State; which is confirm'd by Experience, for People have liv'd twenty four Days upon nothing * but Water, and the Stories of long Abſtinence where Water has been allow'd are not incredible.

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* *Vide* Philoſophical Tranſactions.

1. Long Abſtinence in hot bilious Conſtitutions may be the Parent of great Diſeaſes, yet it is more troubleſome to acid Conſtitutions by the Uneaſineſs it creates in the Stomach.

CHAP. III.

Obſervations drawn from the Nature and moſt ſimple Analyſis of vegetable Subſtances.

PROP. I.

ALL Animals are made immediately or mediately of Vegetables that is by feeding on Vegetables, or on Animals that are fed on Vegetables, there being no Proceſs in *infinitum*.

PROP. II.

Vegetables are proper enough to repair Animals as being near the ſame ſpecifick Gravity, with the Animal Juices, and as conſiſting of the ſame Parts with Animal Subſtances, Spirit-Water, Salt, Oil, Earth; all which are contain'd in the Sap, they derive from the Earth, which conſiſts of Rain-Water, Air, putrified Juices of Plants, and Animals; and even Minerals for the Aſhes of Plants yield ſomething which the Loadſtone attracts. Plants are either eat raw, or prepar'd by the Arts of Cookery.

PROP. III.

The Sap is diverſify'd, and ſtill more and more elaborated and exalted as it circulates through the Veſſels of the Plant.

The Sap when it firſt enters the Root, and is not ſubdued by the Action of the Plant retains much of its own Nature, and has not much of the Vegetable;

being earthy, watery, poor, and ſcarce oleaginous. The Sap after it has enter'd the Root is more and more elaborated as it paſſeth into the Stem, Branches, Leaves, Flowers, Fruit and Seeds. The Juice of the Stem is like the Chyle in an Animal Body, not ſufficiently concocted by Circulation, and is commonly ſubacid in all Plants. This Juice is yielded in great Plenty by Inciſion in ſome Plants. The Juices of the Leaves are, *Firſt*, That obtain'd by Expreſſion which is the nutritious Juice render'd ſomewhat more oleaginous; from this Juice proceeds the difference of the Taſte of the Leaves of Plants. *Secondly*, Wax which is ſcrap'd off by the Bees and is a vegetable Subſtance. *Thirdly*, Manna which is an eſſential Sacharine Salt ſweating from the Leaves of moſt Plants.

The Juices of the Flowers are, *Firſt*, The expreſs'd Juice a little more elaborated. *Secondly*, A volatile Oil and Spirit wherein the particular Smell of the Plant reſides. *Thirdly*, Honey exuding from all Flowers, the Bitter not excepted, this is gather'd by the Bees, and ſuck'd in by their Trunks into their Stomachs. The Juice of the Fruit is ſtill the Juice of the Plant more elaborated. The Juice of the Seed is an eſſential Oil or Balm deſign'd by Nature to preſerve the Seed from Corruption. The Bark contains beſides the common Juice, an oily Juice which ſweats out of divers Plants, when this Juice is in greater Plenty than can be exhal'd by the Sun, it renders the Plant ever Green. This Oil farther inſpiſſated by Evaporation turns by degrees into Balm, Pitch, Roſin, *&c.* Beſides all theſe there is a peculiar Juice in each Species not reduceable to Water, Oils, Balſam, which may be call'd the Blood of the Plant. Thus ſome Plants upon breaking their Veſſels yield a milky Juice, others a yellow of peculiar Taſtes and Qualities.

1. Hence it follows, that he who eats a whole raw Plant, or the expreſs'd Juice of it, takes in a greater Variety of Subſtances, than he who feeds on the

ſame Plant prepar'd or on ſome of the Parts of it, for all Plants have the moſt of the forementioned Ingredients, at leaſt in ſmall Quantities.

2. Vegetables differ from Foſſils, and Animals in that being burnt to Aſhes they yield a fix'd Alkaline Salt which in thoſe of a ſharp Scent, as Muſtard, Onions, *&c.* is in a very ſmall Quantity.

3. The Effects of vegetable Subſtances upon Human Bodies are more various than thoſe of Animal Subſtances; and the Mechaniſm of Plants ſeems to be more various than that of Animals, for the ſame Plant produceth as great a variety of Juices as there is in the ſame Animal, and the different Plants a greater Variety, and yet the Aliment of Plants is one uniform Juice; for from the ſame ſoil may be produc'd a great variety of Plants, whereas different Species of Animals live upon very different ſorts of Subſtances; both Mechaniſms are equally curious, from one uniform Juice to extract all the variety of vegetable Juices, or from ſuch variety of Food to make a Fluid very near uniform, the Blood of an Animal.

4. The ſpecifick Qualities of Plants reſide in their native Spirit, Oil and eſſential Salt; for the Water, fix'd Salt and Earth appear to be the ſame in all Plants.

The Effects of the forementioned Ingredients of Plants are as follows, Vegetable Salts are capable of reſolving the coagulated Humours of a Human Body, and of attenuating, by ſtimulating the Solids and diſſolving the Fluids: Salts likewiſe promote Secretions, Oils relax the Fibres, are Lenient, Balſamick, and abate Acrimony in the Blood. It is by Virtue of this Oil, that Vegetables are nutrimental, for this Oil is extracted by Animal Digeſtion as an Emulſion, and abounds moſt in Plants of full Growth, and when the Salts and Water are in leaſt abundance. Aromatick Plants tho' they abound with Oil, yet it is not ſoft and nutritious, but as it is mix'd with a Spirit, is too heating.

The Volatile Salt and Spirit of Vegetables is penetrating, heating and active, contrary to the Properties of Acids. The Balſams of Plants contain a Volatile Salt, ſuch Balſams when depriv'd of their Acids change into Oils. Wax conſiſts of an acid Spirit of a nauſeous Taſte, and an Oil or Butter which appears white. This Oil is Emollient, Laxative and Anodyne.

Honey is the moſt elaborate Production of the Vegetable Kind, being a moſt exquiſite vegetable Soap reſolvent of the Bile, Balſamick and Pectoral. Honey contains no inflammable Spirit before it has felt the force of Fermentation, for the Diſtillation of it affords nothing that will burn in the Fire.

The Fruits of moſt Vegetables are likewiſe Soaps, all Soaps (which are a Mixture of Salt and Oil) are attenuating and deobſtruent reſolving viſcid Subſtances; ~~for~~ meer Water diſſolves nothing but Salts: but as the Subſtance of Coagulations is not merely Saline, nothing diſſolves them but what penetrates and relaxes at the ſame time, that is a Soap or a Mixture of Oil and Salt.

6. Taſtes are the Indexes of the different Qualities of Plants as well as of all ſorts of Aliment: Different Taſtes proceed from different Mixtures of Water, Earth, Oil and Salt, but chiefly from the Oil and Spirit mix'd with ſome Salt of a peculiar Nature. A Muriatick or Briny Taſte ſeems to be produc'd by a Mixture of an acid and alkaline Salt, for Spirit of Salt and Salt Tartar mix'd, produce a Salt like Sea Salt. Bitter and acrid differ only by the ſharp Particles of the firſt, being involv'd in a greater Quantity of Oil than thoſe of the laſt. Acid or ſowr proceeds from a Salt of the ſame Nature without a Mixture of Oil; in auſtere Taſtes the oily Parts have not diſentangled themſelves from the Salts, and earthy Parts, ſuch is the Taſte of unripe Fruits. In ſweet Taſtes, the acid Particles ſeem to be ſo attenuated, and diſſolv'd in the Oil, as to produce only a ſmall and grateful Titillation.

lation. In oily Taſtes, the Salts ſeem to be intirely diſentangled.

Vegetables have very different Effects on Human Bodies as they contain acid or alkaline Salts, and are to be us'd according to the different Conſtitution of the Body at that time, as will appear by what will be ſaid afterwards. All the Tetrapetalous ſiliquoſe Plants are Alkaleſcent.

PROP. IV.

Mankind take as Aliment all the parts of Vegetables, but their propereſt Food of the Vegetable Kingdom is taken from the Farinaceous or mealy Seeds of ſome Culmiferous Plants, as Oats, Barley, Wheat, Rice, Rye, Maes, Panick, Millet; or of ſome of the ſiliquoſe leguminous, as Peaſe, Beans, &c. Thoſe as they are Seeds (by what was ſaid, Prop. III.) contain the moſt elaborate part of the Plant, are oily, and therefore proper to make the Animal Emulſion of Chyle, and their Oil is not highly exalted, and hot as that of Acrid and Aromatical Plants, but mild and benign to human Bodies.

Barley is Emollient, moiſtning and expectorating. Oats have ſome of the ſame qualities. Barley was choſen by *Hippocrates* as proper Food in inflammatory Diſtempers. Rice is the Food of perhaps two thirds of Mankind, it is moſt kindly and benign to human Conſtitutions, proper for the Conſumptive, and ſuch as are ſubject to Hœmorages, next to Rice is Wheat, the Bran of which is highly Aceſcent and Stimulating. Therefore the Bread that is not too much purged from it is more wholeſome for ſome Conſtitutions; Rye is more Acid, Laxative and leſs nouriſhing than Wheat; Millet is diuretick, deterging and uſeful in Diſeaſes of the Kidneys. Panick affords a ſoft Demulcent Nouriſhment both for Granivorous Birds, and Mankind. Maes affords a very ſtrong Nouriſhment, but more viſcous than Wheat.

Peaſe being depriv'd of any Aromatick parts are mild, and demulcent in the higheſt degree; but being full of Aerial Particles are flatulent, when diſſolved by Digeſtion. Beans reſemble them in moſt of their qualities. All the forementiọn'd Plants are highly aceſcent except Peaſe and Beans.

The mealy parts of the forementiọn'd Plants diſſolv'd in Water, make too viſcid an Aliment to be conſtantly us'd, and juſtly condemn'd by *Hippocrates*. Therefore Mankind have found the means to make them more eaſy of Digeſtion by fermenting, and making ſome of them into Bread, which is the lighteſt and propereſt Aliment for human Bodies, Leaven by its Acid Salt, dividing the Mucous and oily parts of the Meal.

The next ſort of Subſtances which Mankind feed on, are Fruits of Trees, and Shrubs, theſe all contain Water or Flegm, a great Quantity of Oil, much elaborated, and an eſſential Salt, upon the different mixtures of theſe Ingredients, depend their different Qualities, by which they are ſharp, ſweet, ſow'r or Styptick. Of Fruits ſome are Pulpy, others contain'd within a hard Shell, which laſt are indeed the Seeds of the Plants, to which they belong, and contain a great deal of Oil, entangled with Earthly Parts and Salts, which oftentimes make them hard of Digeſtion, and paſs the Alimentary Duct undiſſolv'd. There are other Fruits which contain a great deal of cooling viſcid Juice, combin'd with a Nitrous Salt, which ſometimes makes them offenſive to the Stomach; ſuch are many of the low Pomiferous kind, as Cucumbers, Pompions, tho' amongſt thoſe, Melons when good, have a rich Juice, and ſomewhat Aromatick; they are Diuretick, and there are inſtances of their having thrown People into bloody Urine.

Of Alimentary Leaves, the Olera or Pot Herbs afford an excellent Nouriſhment, amongſt thoſe are the Cole or Cabbage kind, Emollient, Laxative, and re-

reſolvent Alkaleſcent, and therefore proper in caſes of Acidity. Red Cabbage is reckon'd a Medicine in Conſumptions and ſpittings of Blood. Amongſt the Pot Herbs are ſome Lacteſcent Papeſcent Plants, as Lettuce, and Endive, which contain a moſt wholeſome Juice, reſolvent of the Bile, Anodyne and Cooling, extremely uſeful in all Diſeaſes of the Liver. Artichokes contain a rich Nutritious Stimulating Juice.

Of the Stems of Plants, ſome, contain a fine Aperient Salt, and are Diuretick and Saponaceous, as Aſparagus which affects the Urine with a Fetid Smell (eſpecially it cut when they are White) and therefore have been ſuſpected by ſome Phyſicians as not friendly to the Kidneys, when they are older and begin to ramify they loſe this quality.

Of Alimentary Roots, ſome are Pulpy, and very Nutritious, as Turneps, Carrots, theſe have a fattening Quality, which they manifeſt in feeding of Cattle. There are other Roots which contain an Acrid Volatile Salt, as Onions, Garlick, Leeks, Radiſhes, the mildeſt of theſe is Selery. Thoſe ſorts of Roots are Alkaleſcent and Heating; and therefore proper in caſes of Acidity. The Fungus kind, as Muſhrooms, Truffles afford an Alkaline Salt, and much Oil, ſome of them being poiſonous make the others ſuſpicious if taken in too great Quantities.

There are many Vegetable Subſtances us'd by Mankind, as ſeaſonings, which abound with a highly exalted Aromatick Oil, as Thyme, Savoury, and all Spices. Thoſe are heating and the moſt of them hard of Digeſtion. The moſt friendly to the Stomach, is Fennel: Muſtard, which is us'd in Seaſoning abounds with a moſt Pungent Salt and Oil, extremely active, and heating. Sugar is an eſſential Salt of a Plant combin'd with an Oil, which renders it Inflammable.

PROP.

PROP. V.

To give an Account of the Ingredients into which Vegetables reſolve themſelves by the moſt ſimple Operations of Cookery and Chymiſtry.

The Operations of Cookery and Chymiſtry fall much ſhort of the vital force of an Animal Body, no Chymiſt can make Milk or Blood of Graſs, yet it gives ſome light to this Subject, to ſhow into what Parts Vegetables reſolve themſelves by ſuch Simple Operations, as barely ſeparate their Parts without confounding or deſtroying them.

The two Operations already mention'd, *viz.* making an Emulſion and Vegetable Putrefaction reſemble Animal Digeſtion the moſt.

1. In making an Emulſion, the oily Parts of Vegetables diſſolve into a white Liquor, reſembling Chyle. Our Vegetable Food conſiſts of mealy Seeds, Fruit, Bread, *&c.* upon which the Teeth and Jaws act as the Peſtle and Mortar, the Spittle, Bile, Pancreatick Juice, *&c.* are the Menſtruum inſtead of the Water, which the Chymiſt employs, the Stomach and Inteſtines are the Preſs, and the Lacteal Veſſels the Strainers, to ſeparate the pure Emulſion from its Fœces. The Chyle is white, as conſiſting of Salt, Oil, and Water of our Food, much levigated or ſmooth. This likewiſe conſtitutes the whiteneſs of Emulſions.

2. Vegetable Putrefaction (by what has been mention'd before) turns Vegetable Subſtances into an Animal Nature.

3. Amongſt the Ingredients of Vegetables that which conſtitutes the moſt ſpiritous and fragrant part of the Plant, is what paſſeth by Perſpiration, and exhales by the action of the Sun. This is as it were the preſiding Spirit of the Plant, from which it draws its peculiar flavour, and is the moſt active Principle in the Vegetable. Thus every Plant has

its Atmoſphere, which have very various effects on thoſe who ſtay near them, producing Head-Achs, Sleep, Fainting, Vapours; and others, a great refreſhment of the Spirits. It is reported, that in *Brazil* there are Trees which kill thoſe that ſit under their ſhade in a few Hours. This fragrant Spirit is obtain'd from all Plants which are in the leaſt Aromatick, by a cold Still, with a heat not exceeding that of Summer.

4. If to a Plant you pour hot Water, and let it ſtand a ſufficient time, the Liquor ſtrain'd is call'd the infuſion of the Plant, if the Plant be boil'd in the ſame Water, the ſtrain'd Liquor is call'd the Decoction of the Plant. The Infuſions and Decoctions of Plants contain the moſt ſeparable parts of the Plants, and convey not only their Nutritious but Medicinal Qualities into the Blood. This is plain by many Experiments. The Infuſion of *Caſſia Fiſtularis* makes the Urine Green. The Infuſions and Decoctions of Rhubarb, and Saffron will in a quarter of an Hour tinge the Urine with a high Yellow.

5. The moſt oily parts are not ſeparated by a ſlight Decoction, till they are diſentangl'd from the Salts, for if what remains of the Subject after the Infuſion and Decoction, be continu'd to be boil'd down with the addition of freſh Water, a fat ſapid odorous viſcous inflammable frothy Water will conſtantly be found floating a top of the boiling Liquor, which being ſcumm'd off and gently dry'd, will flame away in the Fire. This Liquor is a kind of Soap conſiſting of the Oil and Salt of the Plant.

6. Infuſions and ſlight Decoctions contain more of the Specifick Qualities of the Plant than theſe which are more violent, for by a ſtrong Decoction ſome part of the Taſte and Smell fly off every Moment.

7. The Infuſion and Decoction prepar'd as before being evaporated to a thicker Conſiſtence, according to the ſeveral Degrees of Thickneſs paſſeth into a Gelly, Defrutum, ſapa Rob extract which contain all the

virtues of the Infuſion or Decoction freed only from ſome of the watery parts.

8. The utmoſt force of boiling Water is not able to deſtroy the ſtructure of the tendereſt Plant. The Lineaments of a White Lilly will remain after the ſtrongeſt Decoction.

9. The extract obtain'd by the former Operation burnt to Aſhes, and thoſe Aſhes boil'd in Water, and and filtrated, yield a fiery Salt.

10. The greater Quantity of volatile Salt any Plant contains, which is the caſe of the more pungent in Taſte, and Odour, the leſs it affords of this fixt Alkali: Thoſe fix'd Alkaline Salts do not pre-exiſt in the ſame form in the Plant, for Acid Plants as Sorrel will afford by this Operation, an Alkaline Salt. Thoſe Salts grow ſtill more fiery and Alkaline by a greater degree of Heat. Of all the Eſſential Salts of Plants, that which is in moſt common uſe in Aliment, is Sugar, which rather diſſolves Flegm, than increaſeth it; for it grows tenacious only by long boiling, it is a Sal Oleoſum, for it is both ſoluble in Water, and fuſible in Fire.

11. Another manner of preparing Vegetables is by expreſſing their Juices. Thoſe expreſs'd Juices contain the true Eſſential Salt of the Plant, for if they be boil'd into the conſiſtence of a Syrup, and ſet in a cool place; the Eſſential Salt of the Plant will ſhoot upon the ſides of the Veſſels. Thoſe Eſſential Salts of Plants differ according to the Plant unto which they belong, but are reduc'd into three Claſſes. *Firſt*, Thoſe of Acid Aſtringent, Auſtere Vegetables as of unripe Fruits which reſemble the Tartar. *Secondly*, Thoſe of ſucculent watery Plants, as Endive, Cichory which afford a fine nitrous kind of Salt ſoluble in Water, and very cooling. *Thirdly*, Thoſe from oily Aromatick and odoriferous Vegetables, which will hardly afford any till their Oils be extracted from them: from hence it appears that the expreſs'd Juices of Vegetables not filtrated very clear contain their whole Specifick Virtues.

12. In the preparations of Cookery the moſt volatile parts of Vegetables are deſtroy'd; if any of them are retain'd it is in Decoctions which are made in Balneo.

Decoctions, when we take the Liquor, contain the Specifick Virtues of the Plants, when we feed upon the Plant it makes their ſolid parts more tender, and deprives them of a great deal of their more ſubtile Oils.

13. The vaſcular and ſolid parts of Plants are incapable of any change in the Animal Body, for the remainder of a ſtrong Decoction held over a clear Fire will burn to Aſhes, which is true Elementary Earth. The fibrous and ſolid parts of Plants, paſs unalter'd through the Inteſtines, and ſometimes by ſticking there occaſion great diſorders. Grains and Nuts paſs often through Animals unalter'd. The Excrements of Horſes are nothing but Hay, and as ſuch combuſtible.

14. Vegetable Subſtances contain a great deal of Air, which as they are diſſolv'd in the Alimentary Duct expands itſelf, producing all the diſorders of Flatulency.

15. There are other Preparations of Vegetables by Fermentation, whereby they are wrought up into ſpirituous Liquors, which may be call'd by the general name of Wines. Such fermented Liquors have quite different qualities from the Plant itſelf, for no Fruit taken Crude has the intoxicating Quality of Wine.

CHAP. IV.

Obſervations from the Nature and moſt ſimple Analyſis of Animal Subſtances.

AN Animal conſider'd in its material part, cannot well be defin'd from any particular organical part, which in ſome ſpecies are wanting, in others are more than one, nor from its locomotive Faculty; for there are ſome which adhere to Rocks, and other places. The Characteriſtick of an Animal is to take its Aliment by a voluntary action, by ſome aperture of the Body, which may be call'd a Mouth, and to convey it into another call'd the Inteſtines, into which its Roots are implanted, whereby it draws its Nouriſhment much after the manner of Vegetables, only a Vegetable has its Root planted without itſelf, and an Animal its Root within itſelf. A Fœtus in the Womb is indeed nouriſh'd like a Plant, but afterwards by a Root planted within itſelf, perhaps too an Animal may be diſtinguiſh'd from a Vegetable in that its Juices move through the Canals by a projectile Motion.

PROP. I.

To give a ſhort account of the conſtituent Parts of Animal Subſtances.

An Animal conſiſts of ſolid and fluid Parts, unleſs one ſhould reckon ſome of an intermediate nature as Fat and Flegm.

1. The ſolids ſeem to be Earth bound together with ſome Oil, for if a Bone be calcin'd ſo, as the leaſt force will crumble it, being immers'd in Oil it will grow firm again.

The laſt Animal Solids are Earth in its greateſt Simplicity, for the Chymiſts make Veſſels of Animal Subſtances calcin'd, which will not vitrify in the Fire; for all Earth which hath any Salt or Oil in it, will turn to Glaſs.

2. The Fluids of Animals are more crude, and reſemble thoſe of Vegetables, as they are nearer the Root of the Animal. Thus Chyle may be ſaid to be a vegetable Juice in the Stomach and Inteſtines, and pour'd upon Blood it ſeems like Oil; as it paſſeth into

the Lacteals it grows ſtill more Animal, and when it has circulated often with the Blood, it is entirely ſo.

3 Blood is the moſt univerſal Juice in an Animal Body, and from which all the reſt are deriv'd, the red part of it differs from the Serum, the Serum from the Lymph, the Lymph from the nervous Juice, and that from the ſeveral other Humours that are ſeparated in the Glands.

4. Animal Subſtances differ from Vegetables in two Things. *Firſt*, In that being reduc'd to Aſhes they are perfectly inſipid, all Animal Salts being volatile, flying off with great Heat. *Secondly*, In that there is no ſincere Acid in any Animal Juice.

5 And yet the Parts of the one are tranſmutable into the nutritious Juice of the other. An Animal can nouriſh a Plant, and a Plant an Animal, by which it ſeems probable that Vegetables have the Power of converting the alkaline Juices of Animals into Acids. From the two foremention'd Differences of Vegetable and Animal Subſtances follows, *Firſt*, That all Animal Diet is alkaleſcent, or anti-acid. *Secondly*, That Animal Subſtances containing no fixt Salt, want the aſſiſtance of thoſe for Digeſtion, which preſerve them both within and without the Body from Putrefaction.

6. The conſtituent Parts of Animals are, *Firſt*, Earth. *Secondly*, A peculiar Spirit analogous to that of Plants. *Thirdly*, Water. *Fourthly*, Salts. *Fifthly* Oil.

7. The Earth as was before obſerv'd is ſincere, and immutable.

8. The Spirit is an oily Subſtance ſo attenuated as to become volatile. This Spirit ſeems to be diſtinguiſh'd in every Species, and Individual; a Blood-Hound will follow the Tract of the Perſon he purſues, and all Hounds the particular Game they have in Chaſe, and the Faculty by which they diſtinguiſh particular Men ſeems to be analogous to ours of diſ-

tinguiſhing the different Species of Vegetables by their Scent.

9. Therefore, ſince the Animals of the wild kind have their Scent, and conſequently this preſiding Spirit more high, it is probable that their Juices are more exalted in Proportion.

10. Water is the chief Ingredient in all the Animal Fluids and Solids; for a dry Bone diſtill'd affords a great quantity of inſipid Water. Therefore Water ſeems to be proper Drink for every ſort of Animal.

11. The Juices of Animals conſiſt of Water impregnated with Salts of a peculiar Nature (excepting Chyle which as was ſaid before may be reputed a vegetable Juice, and often contains Acids) Theſe Salts are neither acid, nor perfectly volatile; for in the Evaporation of Human Blood by a gentle Fire the Salt will not riſe, but only the Spirit, and Water, not perfectly fix'd; for Human Blood calcin'd yields no fix'd Salt, nor is it a *Sal Ammoniac*; for that remains immutable after repeated Diſtillations; and Diſtillation deſtroys the ammoniacal Quality of Animal Salts, and turns them alkaline, ſo that it is a Salt neither quite fix'd, nor quite volatile, nor quite acid, nor quite alkaline, nor quite ammoniacal, but ſoft and benign, approaching neareſt to the Nature of a *Sal Ammoniac*. The elementary Salts of Animals are not the ſame, as they appear by Diſtillation; theſe Alterations being made by Fire. Thoſe Salts are of a peculiar benign mild Nature in healthy Perſons who have a vital Force to ſubdue all the ſapid Subſtances which they feed upon, but in ſuch who have not that vital Force, or commit ſome Error in their Diet, theſe Salts are not ſufficiently attenuated, and retain their original Qualities, which they diſcover in Cahexies, Scurvies of ſeveral kinds and other Diſtempers. The Cure of which chiefly lies in the choice of Aliment with Qualities oppoſite to the Nature of theſe Salts.

12. Animal Oil is various according to Principles inherent in it, but being freed from the Earth, Salts,

&c. it is a ſimple unactive principle, and the ſame in all Animals.

13. Animal Subſtances are more eaſily aſſimilated into Animal Subſtances, and therefore it ſeems probable that they are more nouriſhing to Human Bodies than Vegetable.

The Nature of Animal Food muſt depend upon the Nature, Age, Diet, and other Circumſtances of the Animal we feed upon.

Animal Juices as well as Vegetable are in their greateſt Perfection when the Animal is full grown; young Animals participate of the Nature of their tender Aliment, as Sucklings of Milk.

Animal Nouriſhment differs conſiderably as the Animal is terreſtrial, amphibious, or aquatick. Fiſhes contain more of Animal Salts and Oil, for they corrupt ſooner than terreſtrial Animals, ſome Fiſhes as the Thornback when dry'd, taſte of *Sal Ammoniac.*

The muſcular Fibres of Fiſhes are generally more ſmall and tender than thoſe of terreſtrial Animals, and their whole Subſtance more watery. Some Fiſhes as Whitings, can be almoſt entirely diſſolv'd into Water.

From which Qualities a Diet of Fiſh is more rich and alkaleſcent than that of Fleſh, and therefore very improper for ſuch as practiſe Mortification. The Inhabitants of Sea-Port Towns are generally prolifick.

The Oils with which Fiſhes abound often turn rancid, and lie heavy on the Stomach, and affect the very Sweat with a rancid Smell, which is found to be true in ſome Places where the Inhabitants live entirely upon Fiſh.

Notwithſtanding the redundant Oil in Fiſhes they do not increaſe Fat ſo much as Fleſh, by reaſon of their watery Quality.

Water-Fowl abound with the ſame rancid Oil as Fiſh.

Fiſh being highly alkaleſcent, wants to be qualified by Salt and Vinegar.

14. Another Difference of the Fleſh of Animals depends upon the difference of their Food, from which it is not hard to determine their Qualities conſider'd as Aliment. Thoſe Animals that live upon other Animals have their Fleſh and Juices more alkaleſcent, than thoſe that live upon Vegetables.

15. The difference of the Qualities of the Fleſh of the ſame Species, depends upon the manner of living of the Animal.

Abſtracting from other Conſiderations, the moſt healthy Animal affords the beſt Aliment, and the caſtrated; than thoſe that are not ſo.

An Animal that feeds itſelf takes the moſt proper Food, in the propereſt Quantities (if it has plenty enough) has better Air, and more Exerciſe, all which contribute to make the Animal more healthy; for theſe Reaſons *Hyppocrates* commends the Fleſh of the wild Sow above the tame. The wild Kinds of Animals having more Exerciſe, have their Juices more elaborated and exalted; but for the ſame Reaſon the Fibres are harder, eſpecially when old. For this reaſon perhaps the Roe-Buck is the fineſt of the Veniſon Kind. This Rule in ſome meaſure holds true with Fiſhes; Sea-Fiſh living in an Element more agitated, and River-Fiſh are better than thoſe in Ponds.

Eels for want of Exerciſe are fat and ſlimy, for this Reaſon perhaps Fiſh without Fins and Scales were forbid the *Iſraelites*.

As the Fibres of fat Animals are often more tender and moiſt than thoſe of lean, they are more coveted by Mankind, and tame Fowls offering themſelves as it were to Mankind, ſeem to be their natural Food.

16. The Juices of the ſame Animal in Decoctions are often more nouriſhing, when the ſolid Parts are not ſo good, and the Broth made of grown Animals more nouriſhing than that of young; for of the Parts of the ſame Animal the muſcular Fleſh with the nervous Parts, afford the beſt Nouriſhment as containing the moſt ſpirituous Parts. The difference of the

muſcular Fleſh taken in Subſtance depends upon the Hardneſs, Tenderneſs, Moiſture or Dryneſs of the Fibres. The Glands differ according to the particular Juices which they ſeparate from the Blood. Of all the Glands the Livers are the moſt corruptible. Stall-fed Oxen and cramm'd Fowls are often diſeas'd in their Livers.

PROP. II.

To give an Account of the Nature and moſt ſimple Analyſis of Animal Fluids and Solids.

The propereſt Subjects for ſuch an Enquiry are, *Firſt*, The Fluid which begins to receive an Animal Nature without having perfectly attain'd to it, and approaches neareſt to the Nature of Chyle, *viz.* Milk. *Secondly*, That which having attain'd an Animal Nature by Circulation is noxious if retain'd in the Animal; Urine. *Thirdly*, An Animal Fluid no ways excrementitious, mild, elaborated and nutritious, and from which every part of a perfect Animal can be form'd; the White of an Egg. *Fourthly*, The nutritious Juice of a healthy Human Body which reſembles the White of an Egg in moſt of its Qualities. *Fifthly*, The Bones.

1. None of the Animal Fluids above mention'd, in a ſound State is either acid or alkaline. *Firſt*, If to any quantity of warm new Milk you pour Oil of Tartar *per deliquium*, or any other Alkali, no Efferveſcence will follow, but the whole Body of the Liquor will remain at reſt, though it appear ſomewhat thinner. To another quantity of warm Milk pour Spirit of Nitre, or any ſtrong Acid, and again no Motion nor Ebullition will appear, only the Milk preſently after will become thicker than it was; mix together the two Parcels of Milk, upon which the Experiments were made, and a great Efferveſcence will immediately ariſe; from whence the Propoſition is evident, that Milk is neither an Acid nor Alkali, but

when there is an Acid and Alkali mix'd in it, they manifeſt themſelves by their Conflict: Milk doth not diſcover itſelf to be Acid or Alkaline by Trials with the Syrup of Violets.

The ſame Experiments hold in two Parcels of the Urine of a healthy Perſon before it has ſtood twelve Hours.

The ſame Experiments ſucceed on two Parcels of a White of an Egg, only it grows ſomewhat thicker upon mixing with an acid. The Serum of the Blood ſtands the ſame Trials of Acids and Alkalis.

2. The Milks of ſeveral Animals differ but very little as to their ſenſible Qualities; Womens Milk is the ſweeteſt, as to their nutritious Qualities they ſeem to ſtand in the following Order. That of Women, Aſſes, Mares, Goats, Sheep, Cows. The Milk of Animals which make hard Dung is moſt nouriſhing.

3. Milk ſtanding ſome time, naturally ſeparates into an oily Liquor, call'd Cream, and a thinner, blue and more ponderous Liquor, call'd skimm'd Milk, neither of which Parts is naturally acid or alkaline (but may turn ſo by ſtanding for ſome time) nor in the leaſt acrimonious, for being let fall into the Eye they cauſe no Pain or Senſation of Sharpneſs. Milk is a kind of Emulſion, or white Animal Liquor reſembling Chyle prepared chiefly from Vegetables, and after it has been mix'd with the Animal Juices of the Saliva, Bile, pancreatick Juice, *&c.* is eaſily ſeparated from them again in the Breaſts.

4. It differs from a vegetable Emulſion by coagulating into a curdy Maſs with Acids, which Chyle and vegetable Emulſions will not: Acids mix'd with them precipitate a tophaceous chalky Matter, but not a chyly Subſtance; for as was before obſerv'd, if you pour Spirit of Nitre into any Quantity of boiling new Milk, and no Conflict or Efferveſcence will follow, but the Liquor divides it ſelf into Curd and Whey, which Whey turns ſpontaneouſly acid, and

he Curd will turn into Cheeſe as hard as a Stone; which ſhows that the moſt ſolid Parts of Animals may be made of Milk. The ſame Effect of turning Milk into a hard Curd, may happen in a Human Body that bounds with Acids.

5. Milk drawn from a ſound Animal fed on Vegetables, ſtanding in a Heat equal to that of a Man in Health, will ſoon ſeparate itſelf into a Cream, and a more ſerous and ponderous Liquor, which after twelve Days attains to the higheſt Degree of Acidity. But if the Milk be drawn from ſome Animals that feed only upon Fleſh, that have faſted long, are feveriſh, or have undergone hard Labour, it will be more apt to turn rancid and putrify than turn acid, acquiring firſt a ſaline Taſte which is a Sign of Putrefaction, and then it will turn into an Ichor.

6. If to a quantity of boiling new Milk you add by Degrees any fix'd Alkali, as Salt of Tartar, or Oil of Tartar *per deliquium*, there will be a lighter *Coagulum* form'd than by an acid. The Milk by boiling will change into a yellow Colour, and run through all the intermediate Degrees, till it ſtops in an intenſe red. The ſame thing happens by the alkaline Powers of the Body; for when an Animal that gives Suck turns feveriſh, that is, its Juices more alkaline, the Milk turns from its native genuine Whiteneſs to Yellow; to which the Suckling has an Averſion: This was the Caſe (as the learned *Boerhaave* tells us) of the Cows of *Holland*.

7. If a Nurſe ſhould abſtain from all acid Vegetables, from Wine, Malt-Drink, and feed only on Fleſh, and drink Water, her Milk inſtead of turning ſour will turn putrid, and ſmell like Urine. An alkaleſcent Diet except that of Water is often the Caſe of Nurſes in great Families. Their Milk ſubjects the Child to Fevers; on the other hand the Milk of poor People that feed upon an Aceſcent Vegetable Diet, ſubjects the Child to Diſeaſes, that depend upon Acidity in the Bowels, as Cholick: The Symptoms of

ſuch a Conſtitution are a ſour Smell in the Fæces, ſour Belchings, Diſtenſions of the Bowels, and Paleneſs of the Fleſh. The Cure of both Diſeaſes is effected by a change of Diet in the Nurſe from Alkaleſcent to Aceſcent or contrary ways as the caſe requires. The beſt Diet for Nurſes is a Mixture of both.

It follows likewiſe from the foregoing Obſervations, that no Nurſe ſhould give Suck after twelve Hours faſting, and that a tendency to Yellow, is an early Sign of a Fever in the Nurſe.

8. Recent Urine as it is neither Acid, nor Alkaline, diſtill'd yields a Limpid Water, neither Acid nor Alkaline, Saline nor Inflammable, and what remains at the Bottom of the Retort is neither Acid nor Alkaline; but being exhal'd by the Conſiſtence of a Syrup, paſſeth through all the degrees of Colours, Yellow, Red, Brown and Black; and this ſoapy Water being calcin'd affords ſome Quantity of Sea Salt, but only in the caſe of the Animal's taking Sea Salt with its Food.

9. Hence Sea Salt paſſeth unalter'd through all the Strainers of a human Body, the moderate uſe of it is very proper to preſerve Bodies through which it paſſeth from Corruption, it detergeth the Veſſels, and keeps the Fluids from Putrefaction. The Ancients gave the *Sal Gemmæ* in putrid Fevers.

All human Urine diſtill'd affords a Water of a fœtid Odour which that of Animals fed on Vegetables does not. The Urine of hard Drinkers and feveriſh Perſons affords a Liquor extremely fetid, but no Inflammable Spirit, what is Inflammable ſtays in the Blood, and affects the Brain. Great Drinkers commonly die Apoplectick.

10. The Urine is a Lixivium of the Salts that are in a human Body, and the proper Mark of the State and Quantity of ſuch Salts, and therefore very certain Indications for the choice of Diet may be taken from the ſtate of Urine. Though the Salts of human Urine be neither Acid nor Alkaline, theſe Salts

may by the violent Motion of the Blood be turn'd Alkaline, and even Corroſive, and when they begin to turn ſo, they affect the ſmall and tender Fibres of the Brain more ſenſibly than other Parts.

11. Recent Urine diſtill'd with a great Heat, and dry Sand will afford a Volatile Alkaline Salt, and after the ſame manner the Heat of a human Body as it grows more intenſe makes the Urine ſmell ſtill more ſtrong, and of a deeper Colour. But as long as thoſe Alkaline Salts are carried off by Urine, the Brain and Nerves are leſs affected, but on the contrary, when in a Fever theſe Salts are left behind, that is when the Urine turns pale, the Patient is in danger.

12. Recent Urine diſtill'd with a fix'd Alkali is turn'd into an Alkaline Nature, whence it ſeems probable that Alkaline Salts taken into a human Body, have the power of turning its benign Salts into fiery and volatile, on which account they ſeem improper in inflammatory Diſtempers, where the Salts are already too much attenuated. *Hyppocrates* who found out this by Experience order'd in ſuch a caſe Things of an Acid Nature. In general a high colour'd Urine indicates an Acid cooling Diet, for it is certain an Acid or Alkaleſcent Diet makes a great difference in the Salts of a human Body.

13. The Rob or Sapa of Urine diſtill'd with quick Lime affords a fiery, but not an Alkaline Spirit, and Lime Water given inwardly in the Caſe of a Diabetes, will bring the Urine from Limpid Pale to be of a higher Colour, which ſhows the Power of a Lixivium of quick Lime to unlock the Salts that are entangled in the viſcid Juices of ſome ſcorbutic Perſons.

14. Recent Urine will likewiſe cryſtalize by Inſpiſſation and afford a Salt neither Acid nor Alkaline, but of an active Nature, which may be properly call'd the eſſential Salt of a human Body. Urine becomes Alkaline by Digeſtion in a heat not greater than that of a human Body, and throws off a ſtony Matter to the Sides of the Veſſel.

15. The Urine long detain'd in the Bladder as well as a Glaſs will grow red, fetid, cadaverous and alkaline. The Caſe is the ſame with the ſtagnant Water of Hydropical Perſons, which at laſt produce a Drought and feveriſh Heat.

16. From hence very good Rules may be drawn for the Diet of Nephritick and Dropſical Perſons, that it ought to be ſuch as is oppoſite to and ſubdueth the Alkaleſcent Nature of the Salts in the Serum of their Blood; thoſe manifeſt themſelves in the Urine, which as was ſaid before is the Lixivium of the whole Body. Sal Ammoniac may likewiſe be obtain'd from Urine, which is neareſt to the Nature of an Anima Salt.

17. The White of an Egg reſembles the Nutritious Juice of an Animal Body, from the White of an Egg every part of a perfect Animal is form'd, for during the Incubation of the Hen, there is nothing of the Egg conſum'd but the White.

18. The White of an Egg is a viſcous, unactive, inſipid, inodorous Liquor capable of mixing with Water, and ſo mild that apply'd to the moſt ſenſible part, the Eye, it cauſeth no Pain.

19. It is neither Acid nor Alkaline, for if the Juices of an Animal Body were either, ſo as by the mixture of the oppoſites, to cauſe an Ebullition, they would burſt the Veſſels.

20. The White of an Egg gradually diſſolves by Heat, exceeding a little the Heat of a human Body, a greater degree of Heat will thicken it into a white, opaque, dry, viſcous Maſs, and this is the Caſe of the Serum of the Blood, upon which different Degrees of Heat produce contrary Effects.

Attention ought to be had to this Maxim in the Management of Diet, Exerciſe and all outward and inward Application to human Bodies and warm Cataplaſms diſcuſs, but ſcalding hot may confirm the Tumour. Heat in general doth not reſolve and attenuate the Juices of a human Body, for too great Heat will produce Concretions.

21. Spirit of Wine mix'd cold with the White of an Egg, coagulates it as much as boil'd Water, which ſhows that Spirit of Wine is an immediate Styptick; ſo that injected into the Veins it is ſudden Death, and taken by the Mouth in great Quantities is ſometimes ſudden, but always certain Death. Spirituous Liquors are ſo far from attenuating, volatilizing and rendring perſpirable the Animal Fluids, that it rather condenſeth them and hardneth the Solids, and therefore properly us'd to hinder the growth of young Animals, and this it will do by mere external Friction; thereby coagulating the Juices in the Extremities of the Veſſels, hardening and aboliſhing the Canals, and ſo increaſing their Reſiſtance againſt the Force of the influent Liquid, which would otherwiſe ſtretch them. This plainly demonſtrates the bad Effects of inflammable Spirits on human Bodies.

22. The Water gain'd from the White of an Egg by a gentle Diſtillation, is neither Acid nor Alkaline; but by a ſtrong Diſtillation it affords an Alkaline Spirit, Salt, two kinds of Oil, and an Earth, which is another inſtance of the Alterations great degrees of Heat cauſe in Animal Subjects; and hence we may conclude that Volatile Salts never exiſt in their own form, in an Animal Body, that the Heat requir'd to make them volatile endangers the Life of the Animal; hence a highly Alkaleſcent Diet in hot Conſtitutions muſt be hurtful.

23. The White of an Egg will putrify and turn Alkaline by Digeſtion, a ſingle Grain of this putrify'd Subſtance has operated like a Poiſon, cauſing vomiting and a Looſeneſs, the Antidote of this Poiſon is ſome Acid Liquor, and ſuch are indeed indicated when the Juices of a human Body verge to Putrefaction. The White of an Egg during Incubation is diſſolv'd, but not properly ſpeaking putrify'd, for in ſuch a State it would be unfit for Nutrition.

24. It ſeems probable that the Bile in a human Body by ſtagnating putrifies, cauſing a Cholera Morbus in the firſt Paſſages, and a Peſtilential Diſtemper when it mixeth with the Blood. In ſuch a ſtate of the Bile, the Aliment ought to be thin to dilute, demulcent to temper, or acid to ſubdue and deſtroy an Alkaline Acrimony.

The Nutritious Juice of a healthy Animal reſembles the White of an Egg in moſt of its Qualities, but this nutritious Juice being a ſubtile Liquor, ſcarce obtainable from a human Body, the Serum of the Blood is fairly ſubſtituted in its place.

25. The Serum of the Blood ſtands the forementTrials, and diſcovers itſelf to be neither Acid nor Alkaline, only Oil of Vitriol thickens and the Oil of Tartar thins it a little.

26. The Serum of the Blood digeſted in a Heat nor greater than that of a human Body in health, will gradually become thinner, begin to ſmell Cadaverous and putrify, and at laſt, like the White of an Egg, turn to an Alkaline Ichor, that ferments with Acids, and committed to Diſtillation affords like the White of an Egg, an Alkaline Salt. This ſhows the effect of gentle Heat in diſſolving Coagulations, for even the viſcous Matter which lies like Leather upon the extravaſated Blood of Pleuritick People may be diſſolv'd by a due degree of Heat.

27. When the Blood ſtagnates in any part of the Body, it firſt coagulates, then reſolves, turns Alkaline, Putrid and Corroſive.

28. As the Serum of the Blood is reſolvable by a ſmall Heat, a greater Heat coagulates it ſo as to turn it horny like Parchment, but when it is throughly putrified it will no longer concrete. The Blood of ſome Perſons who have dy'd of the Plague could not be made to concrete, by reaſon of the Putrefaction already begun.

29. The Serum of Blood coagulates like the White of an Egg with cold Spirit of Wine.

30. The Serum of the Blood is more Saline than the White of an Egg, perhaps by the Salts taken in Nouriſhment, and has ſomething of a more fetid urinous Scent.

31. The Serum of the Blood affords by Diſtillation an exceeding limpid Water, neither Acid nor Alkaline, which ſhows that the moſt ſubtile part of the Blood approacheth nearer to Water than any other Liquor, and that the Blood naturally contains no volatile Salt.

32. Theſe Experiments are to be made on the Blood of healthy Animals: It is poſſible in a lax and weak Habit of Body, where the Chyle is not throughly aſſimilated by Circulation, but floats on the Blood like Oil, that ſuch a Serum might afford quite other Contents, and perhaps even an inflammable Spirit, by reaſon of the Vegetable Nature of the Chyle.

33. The Serum of the Blood by a ſtrong Diſtillation affords a Spirit, or Volatile Alkaline Salt, and two kinds of Oil, and an Earth which ſtill proves the Effect of Heat in human Bodies, in changing the benign Salts into Alkaline.

34. The Serum of the Blood is attenuated by Circulation, ſo as to paſs into the minuteſt Channels of an Animal Body, and become fit Nutriment for it, but by the continual Attrition, and Heat of ſome of its Particles becomes ſharp and offenſive to the Body: Nature has provided the Kidneys to diſcharge them. Hence appears as by Prop. VIII. Chap. II. the continual Neceſſity of a freſh Recruit of Chyle, which like an Emulſion dilutes the Serum, the Miſchiefs ariſing from the Retention of Salts, that ought to paſs by Urine, and likewiſe the proper Indications for cooling and diluting, in ſuch an Alkaleſcent State of the Fluids.

35. It appears by Experiments made upon Bones, and other Animal Solids, that they conſiſt of the ſame Principles with the Fluids, a dry Bone diſtill'd affords

a great Quantity of inſipid Water, after the Bones have undergone the Violence of the Fire, the Aſhes afford no fixt Salt, only ſometimes in Animals that take Sea Salt, there will be a very ſmall Proportion of that in the Aſhes.

36. The Animal Fluids and Solids are reſolvable into the ſame Principles, and this is true not only of the Fluids and Solids themſelves, but likewiſe of all Preparations of them. The Gellies made of the Decoction of lean Fleſh, and Bones in clear Water are reſolvable into the ſame Principles as the Fleſh and Bones themſelves, and if theſe Decoctions be repeated till the Water comes off clear, the Remainder yields no Salt by Diſtillation and little Oil; therefore it is poſſible to extract the whole Virtues of Animal Subſtances by Decoctions, but the gentleſt, extract the moſt volatile and fineſt Parts after the Oil or Fat is ſeparated.

37. Preparations by Cookery of Fiſh or Fleſh ought to be made with regard to rectifying their moſt noxious and ſlimy Subſtances, and to retain thoſe that are moſt Nutritious; ſuch Preparations as retain the Oil or Fat are moſt heavy to the Stomach, which makes bak'd Meat hard of Digeſtion.

38. By Experiments of the Mixture of different Subſtances with the Serum of the Blood, it appears that all Volatile Alkalis thin it, and Acids coagulate it. I ſaid Volatile Alkalis for the Serum being mix'd with an equal Quantity of Oil of Tartar *per deliquium*, will grow ſomewhat thicker, and an Alkaline Vapour ariſeth from the Mixture; but the ſame Proportion of Spirit of Sal Ammoniac makes the Serum thinner without cauſing any Alteration in the Scent or Colour.

39. Spirit of Vitriol pour'd to pure unmix'd Serum coagulates it as if it had been boil'd. Spirit of Sea Salt makes a perfect Coagulation of the Serum likewiſe, but with ſome different Phenomena from the former. The Spirit of Nitre produceth the ſame Effect.

The Serum which is mix'd with an Alkali being pour'd to that which is mix'd with an Acid raiseth an Effervefcence, at the Ceſſation of which the Salts, of which the Acid was compos'd, will be regenerated.

40. Vinegar is an Acid of a very peculiar Nature cooling and yet not coagulating; for Spirit of Vinegar gently dilutes the Serum of the Blood, and even the Oil of Tartar being pour'd to this Mixture cauſeth no Effervefcence; tho' *Honiberg* ſays, that Spirit of Vinegar concentrated, and reduc'd to its greateſt ſtrength will coagulate the Serum.

41. The Mixture of the Solutions of Sea-Salt, Sal Gemmæ, Borax Nitre, and Sal Ammoniac, cauſe no change of Colour in the Serum; but diſſolve its Texture a little, all except that of the Borax. Glaubers Salt maketh a ſtrong Coagulation of the Serum by reaſon of the Oil of Vitriol it contains.

42. All ſaponaceous Subſtances, which are a Mixture of Oil and alkaline Salt, thin the Blood without cauſing any Effervefcence; Spirit of Harts-Horn given in great Quantities will produce Hemorrhages, which I have known by Experience, and therefore is very improper in many Caſes. *Boerhaave* in his Chymiſtry, ſays, That *Sal volatile oleoſum* will coagulate the Serum on Account of the Alcahol or rectify'd Spirit it contains.

43. The Tincture of Salt of Tartar, *viz.* a Preparation of the higheſt rectify'd Spirit of Wine, and the ſtrongeſt fix'd Alkali, preſerves the Serum in a neutral State; for the Spirit of Wine tends to coagulate, and the Alkali on the contrary to diſſolve it, whence it becomes neither thicker nor thinner.

44. What we take in common Aliment is endued with the above mention'd Qualities in ſome degree. Therefore from theſe Experiments very uſeful Indications for Diet may be taken according to the different State of the Blood, as will appear by what follows.

CHAP. V.

Of the Effects of different alimentary Subſtances upon the Fluids and Solids of a Human Body.

PROP. I.

DIfferent Sorts of Aliments are not ſubdu'd or aſſimilated by the vital Force of a Human Body ſo intirely, as to be diveſted of their original Qualities; but while they repair the Fluids and Solids, act variouſly upon them, according to their different Natures. Therefore,

1. The proper Way of treating the Subject of Aliment is to conſider the Actions of the ſeveral Sorts of it upon the Fluids and Solids of Human Bodies, and to ſeparate at leaſt in Idea their Alimentary from their Medicinal Qualities.

PROP. II.

The Diſeaſes of Human Bodies often require Subſtances of more active Principles, than what are found in common Aliment, in order to produce ſudden Alterations: But where ſuch Alterations are not neceſſary, the ſame Effect may be obtained by the repeated Force of Diet, with more Safety to the Body, where the leſs ſudden Changes are leſs dangerous. The ſmaller Activity of Aliment is compenſated by its Quantity, for according to the Laws of Motion, if the Bulk and Activity of Aliment and Medicines are in reciprocal Proportion, the Effect will be the ſame.

1. All Bodies which by the Animal Faculties can be changed into the Fluids and Solids of our Bodies are call'd Aliment. But to take it in the largeſt Senſe, by Aliment I underſtand every thing which a Human

Creature takes in common Diet, as Meat, Drink, and Seaſoning, as Salt, Spice, Vinegar, *&c.*

2. It has been explain'd *Prop.* VII. *Chap.* II. how the Aliment in moving through the capillary Tubes at laſt, as it were ſtagnates and unites it ſelf to the Veſſel or Tube through which it flows. But in this Motion it will act differently, both upon the Fluid and Solid, according to its different Nature. Every thing that acts upon the Fluids muſt at the ſame time act upon the Solids, and contrariwiſe, yet one may ſeparate theſe two Actions in Idea.

PROP. III.

To enumerate the different Actions upon the Fluids and Solids of a Human Body.

There is a multitude of Words to expreſs the various Alterations which are produc'd in a Human Body by Diet and Medicines, but as far as relates to our preſent Subject, they may be reduc'd to the following general Heads.

1 The Actions upon the Solids are, *Firſt*, Stimulating or increaſing their Vibrations or oſcillatory Motions. *Secondly*, Contracting, that is diminiſhing their Length, and increaſing their Thickneſs. *Thirdly*, Relaxing or making them more flexible in their leſs coherent Parts. And *Laſtly*, Conſtipating or ſhutting up the Cavity of the capillary Tubes.

2. The Actions upon the Fluids are either changing their Qualities or their Quantity.

3. Their Qualities are chang'd by, *Firſt*, Attenuating and condenſing, that is diminiſhing or increaſing the Bulk of their Particles. *Secondly*, By rendring them acrimonious or mild. *Thirdly*, By coagulating and diluting, that is, making their Parts more or leſs coherent. *Fourthly*, By increaſing or diminiſhing their Motion through the Veſſels.

4. The Quantity of the Fluids is increas'd or diminiſh'd by the Increaſe or Diminution of the Quantity

of Aliment; or by the ſuppreſſing or promoting Animal Secretions.

5. That all theſe Actions can be perform'd by Aliment as well as Medicines, is plain from Reaſon, Experience, and in ſome Caſes by ocular Demonſtration, by obſerving the Effects of different Subſtances upon the Fluids and Solids of a Human Body when the Veſſels are open, and gape by a Wound or Sore. The Effects of tepid Water and farinaceous Subſtances in relaxing; of Spirits, in ſtopping Hemorrhages, and conſolidating the Fibres; the Power of alkaline Abſorbents in ſubduing Acrimony, and of Oil in ſtopping Perſpiration is well known to Chirurgeons, who are likewiſe well acquainted with the Influence of Diet upon the Wounds and Sores of their Patients, and from the Condition of the one, can gueſs at the Errors or Regularity of the other. Acrid Subſtances will break the Veſſels, and produce an Ichor inſtead of laudable Pus. The chief Intention of Chirurgery as well as Medicine, is keeping a juſt *Equilibrium* between the influent Fluids, and vaſcular Solids, when the Veſſels are too lax, and don't ſufficiently reſiſt the Influx of the Liquid, it begets a *Fungus* or proud Fleſh; when the Balance is on the other ſide, it produceth a Cicatrice. Were it not criminal to try Experiments upon Patients, which they too often try upon themſelves, I could anſwer that the Doctrine of this Chapter would be verify'd by Experience in Wounds and Sores, as it is often perceptible even in an Iſſue.

PROP. IV.

To explain the Effects of different alimentary Subſtances upon the Fluids and Solids of a Human Body.

1. The firſt ſort of Alimentary Subſtances are ſuch as are of ſo mild a Nature, that they act with ſmall Force upon the Solids, and as the Action and Reaction are equal, the ſmalleſt Degree of Force in the

Solids digeſts and aſſimilates them; of ſuch ſort is Milk and Broths made of the muſcular Parts of Animals, which are as it were already prepar'd, and eaſily converted into Animal Subſtances; theſe are proper Nouriſhment for weak Bodies, and agree perfectly well with them, unleſs there be ſome particular Acrimony in the Stomach, which ſometimes makes them offenſive, and which Cuſtom at laſt will overcome.

2. Thoſe Things which ſtimulate the Solids, produce the greateſt Alterations in an Animal Body. This is ſeen in many Inſtances. Violent Sneezing produceth Convulſions in all the Muſcles of Reſpiration, and an univerſal Secretion of all the Humours, Tears, Spittle, Sweat, Urine, *&c.* So great an Alteration can be produc'd only by the Tickling of a Feather, and if the Action of Sneezing ſhould be continu'd by ſome very acrid Subſtance, it will at laſt produce Head-ach, Vomiting, univerſal Convulſions, Fever and Death. Therefore ſuch active Subſtances as taken inwardly in ſmall Quantities make great Alterations in the Fluids, muſt produce this Effect by their ſtimulating Quality.

3. Acrid Subſtances, which are ſmall enough to paſs into the capillary Tubes, muſt ſtimulate the ſmall Fibres, and irritate them into greater Contraction, and ſtronger Vibrations.

4. Many things which we take as Aliment, or with our Aliment have this Quality in ſome degree: As the Juices of acid Vegetables, fermented Liquors, eſpecially ſharp Wines, fermented Spirits, aromatical Vegetables as Fennel, Savory, Thyme, Garlick, Onions, Leeks, Muſtard, which abound with a volatile pungent Salt, all Spices, in general all Vegetables, which being corrupted eaſily reſolve themſelves into a fetid oily Alkali. Onions, Garlick, Pepper, Salt, and Vinegar taken in great Quantities by their *Stimulus*, excite a momentary Heat and Fever, and therefore in ſome Caſes to be mention'd afterwards are very proper.

5. The ſolid Parts may be contracted various Ways. *Firſt*, by diſſolving their Continuity, for when a Fibre is cut through, it contracts itſelf at both Ends; therefore all Things which are ſo acrimonious as to deſtroy the ſmall Fibres muſt contract them. *Secondly*, Whatever makes a Depletion of the Veſſels gives room to the Fibres to contract; therefore Abſtinence produceth this Effect in the beſt Manner. Whatever ſhortens the Fibres, by inſinuating itſelf into their Parts, as Water in a Rope, contracts; fermented Spirits poſſeſs their Quality in a great Degree.

6. The more oily any Spirit is, the more pernicious, becauſe it is harder to be eluted by the Blood. Brandy is more eaſy to be ſo, than Spirit of Juniper, and that than Spirit of Aniſeed. Compound aromatical Spirits deſtroy, *Firſt*, By their fermentative Heat, *Secondly*, By their oily Tenacity. *Thirdly*, By a cauſtick Quality reſiding in Spices apt to deſtroy the ſolid Parts, but theſe Qualities render them proper in ſome Caſes taken in ſmall Quantities.

7. Fermented Spirits contract, harden and conſolidate many Fibres together, aboliſhing many Canals, eſpecially where the Fibres are the tendereſt as in the Brain, by which Quality they deſtroy the Memory and intellectual Faculties.

8. Acid auſtere Vegetables have this Faculty of Contracting and ſtrengthning the Fibres without ſome of the bad Effects of fermented Spirits, as all Kinds of Sorrel (the Virtues of which lie in an acid aſtringent Salt, a ſovereign Antidote againſt the putreſcent bilious Alkali) ſeveral Kinds of Fruits, as Quinces, ſome ſorts of Pears with the Marmalades made of them, Medlars, Capers, Barberries, Pomegranates, Purſlain, ſuch are eaſily diſtinguiſh'd by a rough ſtyptick Taſte. Amongſt Drinks Auſtere Wines, unripe Fruits likewiſe have the ſame Quality, but are apt to obſtruct the Nerves, and occaſion Palſies.

9. Relaxing the Fibres is making them flexible, or eaſy to be lengthen'd without Rupture, which is done only in the capillary vaſcular Solids. Amongſt Liquids endued with this Quality of relaxing, warm Water ſtands firſt, next watery Decoctions of farinaceous Vegetables, or Grains, as Oats, Barley, *&c.* All ſweet and mild Garden-fruits, almoſt all Pot-Herbs, Spinage, Betes, Cabbage, Coleworts, and all that Tribe. Red Cabbage beſides is reckon'd a good Pectoral; ſome of the lacteſcent and papeſcent Plants, as Lettuce, Cichory, whoſe Milk is anodyne and reſolvent, therefore good in Diſeaſes of the Liver; but all ſuch Vegetables muſt be unfermented, for Fermetation changes their Nature. Oils expreſs'd from mild Plants, Animal Oils, Cream, Butter, Marrow, which laſt is of all oily Subſtances the moſt penetrating.

10. It is not probable that any thing which Human Creatures take as Aliment, ſhould have the Quality of entirely conſtipating or ſhutting up the capillary Veſſels, becauſe ſuch Subſtances could hardly enter the Lacteals, and if they did, would ſtop the Circulation in the Lungs, but all viſcid Aliment ſuch as is made of farinaceous Subſtances unfermented, neither paſs the Lacteals, nor circulate ſo eaſily as the ſame Subſtances fermented. Some of the *Fungus* Kind gather'd by miſtake for edible Muſhrooms, have produced a Difficulty of Breathing.

11. The Qualities of the Fluids can be likewiſe chang'd by Diet, as *Firſt*, By attenuating or diminiſhing the Coheſion of the Parts of the Fluid. The Coheſion of the Parts depends upon the Weight and Quantity, therefore Abſtinence and a ſlender Diet attenuates, becauſe Depletion of the Veſſels gives room to the Fluid to expand itſelf.

12. Whatever penetrates and dilutes at the ſame time; therefore Water impregnated with ſome penetrating Salt, attenuates moſt ſtrongly; Water with *Sal Ammoniac* will paſs through a Human Skin. To

this Quality may be juſtly aſcrib'd the great Effects of medicated Waters, all ſtimulating Subſtances by increaſing the Motion of the Blood attenuate, unleſs they increaſe the Motion ſo much, as at laſt to produce Coagulation.

13. Thickening the Blood is moſt eaſily brought about by exhaling the moſt liquid Parts by ſudorifick or watery Evaporations; but this brings it into a morbid State. Acid auſtere Vegetables before mention'd, have this Quality of condenſing the Fluids, as well as ſtrengthning the Solids.

14. The Blood of labouring People is more denſe and heavy than of thoſe who live a ſedentary life, and the Diſeaſes which People imagine proceed from the Thickneſs of Blood, come often from the contrary Cauſe; too thin Blood ſtrays into the immediately ſubordinate Veſſels which are deſtin'd to carry Humours ſecreted from the Blood, according to what was ſaid Prop. V. Chap. II. This cauſes an Obſtruction falſly aſcrib'd to the Thickneſs of the Blood.

The Qualities of the Blood in a healthy State are to be florid when let out of the Veſſel, the red Part congealing ſtrongly and ſoon together in a Maſs moderately tenaceous, ſwimming in the Serum, which ought to be without any very yellow or greeniſh caſt. The Gravity of Blood to Sea-Water is as 26 is to 25, that of the Serum to the ſame Water, as 300 to 352, it's an eaſy matter to examine extravaſated Blood by theſe Marks.

15. Acrimony is not Natural, but induc'd into the Fluids of an Animal Body. Acrimony may be introduc'd by Diet, that is either Muriatick, (Briny) or Acid, which likewiſe is of two ſorts, of things naturally Acid, or (made ſo by fermentation) Aromatick, conſiſting of Salts, and highly exalted Oils, intimately united. Or *Secondly*, by increaſing the Velocity of the Blood, and conſequently the Attrition of the Parts.

16. Acrimony in the Blood it ſelf is commonly of three Sorts according to the Nature of the Salts in which it reſides. Acid, Alkaline or Muriatick as in the Sea Scurvy, but the laſt approaches more towards the Alkaline, and admits of the ſame Cure: Acid Acrimony reſides chiefly in the firſt Paſſages, proceeding often from the Weakneſs of Digeſtion, and the too long Duration of Vegetables, and Milk in the Stomach. Animal Subſtances are all Alkaleſcent, of Vegetable Subſtances ſome are Acid, others Alkaleſcent, and each Sort is to be uſed according to the two different Intentions.

17. Antiacid Vegetables are, *Firſt*, All kinds of Garlick, Onions, Leeks, and Selery, the Antiſcorbutick Plants, Carrots, Turnips, Eringo Roots, Aſparagus, Horſe-radiſh, Muſtard, Cabbage. *Secondly*, All Animal Subſtances eſpecially of ſuch as live on other Animals; the Juices of which are more Alkaleſcent than of the Animals which live upon Vegetables, ſuch are moſt Fiſhes, eſpecially ſome of the Teſtaceous kind. *Thirdly*, Water as it dilutes and ſubdues Acidity. *Fourthly*, Oils are Antiacids ſo far as they blunt Acrimony, but as ſome times they are hard of Digeſtion they produce Acrimony of another Sort.

18. On the other Hand when the Acrimony is Alkaline, which is more frequently the Caſe in the circulating Juices. The proper Diet is Decoctions of Farinaceous Vegetables, which ſeem appointed by Nature for the Vegetable Diet of human Creatures. This Alkaline Acrimony indicates the copious uſe of Vinegar, and Acid Fruits, as Oranges, which contain a Juice, moſt effectual in the Cure of the Muriatick Scurvy of Mariners; the Juice of Lemons is likewiſe more proper and more cooling and aſtringent than that of Oranges. In this caſe all the mild Antiſcorbuticks are indicated as Sorrel, Cichory, Lettuce, Apples, and of Liquids Whey: On the contrary all the Acrid Antiſcorbuticks, as

Scurvygraſs, Horſeradiſhes, Muſtard, *&c.* are hurtful in this hot Scurvy.

19. There is a third ſort of Antiſcorbuticks proper in this Alkaleſcent State of the Fluids, which is call'd Aſtringent, ſuch as Pomegranates, Capers, and moſt of the common Pickles prepar'd with Vinegar. The Extremity of Alkali is Putrefaction. All Acid Subſtances, and Sea Salt reſiſt Putrefaction, but as it is a ſharp ſolid Body unalterable in an Animal Body, when it is taken in too great Quantites in a conſtant Diet of Salt Meat, it breaks the Veſſels, produceth Eroſions of the ſolid Parts, and all the Symptoms of the Sea-Scurvy, which is to be cured by Acid Vegetables, and not by hot Antiſcorbutick; all Spices likewiſe induce this Acrimony, as was hinted before.

20. There are other Subſtances which are oppoſite to both Sorts of Acrimony which are call'd demulcent or mild, becauſe they blunt or ſheath theſe ſharp Salts, as Farinaceous Legumes, ſuch as Peaſe, Beans, Lentils. Native Oils of Animals, as Cream, Butter, Marrow, which laſt is a Specifick in that Scurvy which occaſions a Crackling of the Bones, in which caſe Marrow performs its natural Function of moiſtening them. All Plants which are without Smell or pungent Taſte are demulcent, as likewiſe all the Alimentary Parts of ſound Animals, for none of their Juices will hurt the Eye or a freſh Wound. Acrimony which is not viſcid may be cur'd by Diet, but Viſcidity requires more active Subſtances to diſſolve it.

21. Whatever renders the Motion of the Blood more languid than natural diſpoſeth to an Acid Acrimony: What accelerates the Motion of the Blood beyond what is natural diſpoſeth to an Alkaline Acrimony.

22. The next Alteration which is made in the Fluids is rendring it more thin, which is perform'd by Diluting, there is no real Diluent but Water, every

Fluid is diluent as it contains Water in it. Water dilutes, but at the ſame time relaxeth, this laſt Quality is taken off by mixing ſome Acid Juice with it; Water mix'd with Acids reſiſts the Heat and Alkaleſcent State of the Fluids, as long as there is Thirſt, a quick Pulſe, Dryneſs, with a free Paſſage by Urine, and Stricture of the Veſſels, ſo long is Water ſafely taken.

23. Oppoſite to Dilution is Coagulation or Thickening, which is perform'd by diſſipating the moſt liquid Parts by Heat, or by inſinuating ſome Subſtances which make the Parts of the Fluid cohere more ſtrongly. All Vegetables which make a black Tincture with the Vitriol of Steel have this Quality, they have commonly a rough ſtyptick Taſte: Vinegar as was ſaid before is an Acid very particular, for it doth not coagulate: Inflammable Spirits coagulate the Fluids, and harden the Solids in a ſtrong Degree.

24. Reſolving what is congeal'd is turning it into a Fluid again; this can be perform'd by watery Liquors, impregnated with ſome penetrating Salt, but more effectually by ſaponaceous Subſtances compos'd of Oil and Salt, ſuch are Honey, and the Robs and Gellies of moſt Fruits. Vinegar and Honey mix'd is a ſtrong reſolvent. Spiſſitude is ſubdu'd by Acrid things, and Acrimony by inſpiſſitating.

25. The ſecond Manner of Operating upon the Fluids is by increaſing or diminiſhing their Quantity, the firſt is perform'd by a plentiful Diet, and the Suppreſſion of Evacuations, the ſecond either by a ſpare Diet or promoting the Animal Secretions, that is expelling the Fluids out of the Body. Tho' Secretions of the laudable Juices are beſt accompliſh'd by increaſing the Fluids.

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26. Whatever generates a Quantity of good Chyle, muſt likewiſe generate Milk, ſuch is new Milk ſeaſon'd with Sugar or Salt. This will encreaſe the Milk when it is diminiſh'd by the too great uſe of Fleſh Meat: Gruels made of Grains, Broths, Malt Drink not much hopp'd, Poſſet Drinks, and in general whatever relaxeth, have the ſame Effect.

27. There are as many good Pectorals of the Alimentary, as of the Medicinal kind, as all Preparations of Barley, Oats, Honey, all Saponaceous Subſtances before-mention'd with attenuate Flegm.

28. There is Aliment lenitive expelling the fæces without ſtimulating the Bowels, ſuch are Animal Oils quite freſh (for by ſtanding they grow Acrid) as Cream, Butter, Marrow, Broths made of the Parts of Animals about the Meſentery, Oils expreſs'd from ripe Fruits (from unripe they are auſtere and aſtringent) the Juices of mild and ripe Fruits, Decoctions of farinaceous Vegetables, natural Soaps as Honey, Sugar, ſuch Diet is proper for the hot Conſtitutions of warm Countries, where ſtrong Perſpiration exhales the Moiſture. Water, Milk, Whey, taken in the open Air without much exerciſe ſo as to make them perſpire, relax the Belly.

29. There are Aliments which beſides this lubricating Quality, ſtimulate in a ſmall Degree. Gellies made of the ſolid parts of Animals, as of their Horns, ſtimulate by the Salts that are in them. Salted Fleſh which often throws Ships-crews into Fluxes, Shell Fiſhes which have a Saline Taſte, Garden Fruits which have any Acrimony, moſt ſorts of Berries, ſome of which will produce Diarrhœas, warm Water mix'd with Honey, and Honey mix'd with Acids diſſolve Flegm in the Bowels. There are others which promote the Secretion of Bile, ſuch as all natural Soaps, the Juices of Fruits ſharp, and ſweet, eſpecially Grapes, the immoderate uſe of which will produce a Cholera Morbus.

30. Diureticks are Decoctions, Emulſions and Oils of Emollient Vegetables, in ſo far as they relax the Urinary Paſſages: Such as relax ought to be try'd before ſuch as force and ſtimulate. Thoſe Emollients ought to be taken in open Air to hinder them from perſpiring, and on empty Stomachs. Vegetables which abound with eſſential Salt, are Diuretick by ſtimulating, as Sorrel, Chervil, Parſly, Eringo, *&c.* and likewiſe all ſuch as contain an Aromatical Balſam as Aſparagus, Fennel, *&c.*

31. As to Sudorificks, it ought to be conſider'd that the Liquid which goes off by Sweat, is often the moſt ſubtle part of the Blood, and ought not to be forc'd away without manifeſt Neceſſity. The Matter of inſenſible Perſpiration is mild, that of Sweat reſembles Urine, and yields a volatile Salt, oily and fetid. When Sweat is vehement it will grow bloody. The Matter of Sweat is the watery part of our Drink impregnated with this Salt, ſometimes in weak and conſumptive People, Crude, Chyle, and ſometimes (as was ſaid before) the moſt elaborate ſubtile part of our Blood, as in fat People who have a ſmall inſenſible Perſpiration.

32. Sweat is produc'd by changing the balance between the Fluids and Solids (in which it muſt be confeſt that true Health conſiſts) ſo as the projectile Motion of the Fluids overcome the Reſiſtance of the Solids; therefore it is produc'd by relaxing the Paſſages of the Skin. *Secondly*, By diluting. *Thirdly*, By diſſolving the Blood. *Fourthly*, By accelerating its Motion. Water dilutes and relaxes at the ſame time, therefore the beſt and ſafeſt Sudorifick, watery and Acid things mix'd prove ſtrong Sudorificks; Spices by Heating, and diſſolving the Blood are not ſo proper and ſafe Sudorificks.

33. Inſenſible Perſpiration is the laſt and moſt perfect Action of Animal Digeſtion; the keeping it up in due Meaſure, is the cauſe as well as ſign of Health, and the leaſt Deviation from that due Quantity, the

certain forerunner of a Diſeaſe, therefore the beſt Indications for Diet are taken from the Meaſure of Perſpiration.

The Food which is moſt Vaporiſh and perſpirable is certainly the moſt eaſily digeſted; but ſuch may be proper or improper, for the Animal according to its Circumſtances, eſpecially the Quantity of its Muſcular Motion. By Prop. IV. Chap. II. The ſtrength of the Aliment muſt be proportion'd to the action of the Solids upon it, which in an Animal under a courſe of exerciſe or hard labour is much ſtronger; therefore Aliment too Vaporoſe or Perſpirable, will ſubject it to the inconveniences of too ſtrong a Perſpiration, which are Debility, Faintings, and ſometimes ſudden Death. What diminiſheth Sweating, or the ſenſible Perſpiration increaſeth the inſenſible, for that reaſon a Strengthning and Aſtringent Diet often conduceth to this purpoſe. According to the Experiments of *Sanctorius* the moſt nouriſhing Aliment is the leaſt perſpirable except Mutton, which of all others is moſt ſo, and Hog's Fleſh the leaſt; and for the ſame reaſon Eels, and all very fat and oily Subſtances: copious Food of ſmall Nouriſhment perſpires much.

A Stomach too void or too full ſtops Perſpiration. The Fruits of the low Pomiferous Plants as Cucumbers, Melons, &c. ſtop Perſpiration, therefore they are wiſely provided by Nature in a Seaſon when the Perſpiration is too great. Variety of Meats diminiſh Perſpiration, Honey in cold Conſtitutions increaſeth Perſpiration, except when it promotes too great a Secretion of the Bile, and then it diminiſheth it: Drinking exceſſively during the time of Chylification, ſtops Perſpiration. Let thoſe who ſit long at their Bottle after Meals conſider this.

The moſt ſure ſign of a deficient Perſpiration is Flatulency or Wind.

34. The Menſes are promoted. *Firſt*, By every thing which occaſions a Plethora, ſuch are all Aliments of eaſy Digeſtion, taken in ſufficient Quantity. *Secondly*, By all Saponaceous Subſtances, which incide the Mucus in the firſt Paſſages. *Thirdly*, By Spices and warm Vegetables which abound with a Volatile oily Salt. Of theſe we have ſpoken before.

35. Heat in Animal Bodies is produc'd by the Attrition of the Fluids and Solids, for when that ceaſeth as in Death, there is extremity of Cold. The ſolid parts of Animals rubbing againſt one another would in time produce a Heat capable to deſtroy the Parts, had not Nature provided an oily Subſtance to lubricate and moiſten them; when that fails as happens ſometimes in the Scurvy, Gout, and Rheumatiſm, an Inflammatory Heat is often produc'd.

36. Stimulating Subſtances taken in Diet increaſe Heat, becauſe they increaſe the Oſcillatory Motion of the Solids, but moſt of all Inflammatory Spirits. Whatever increaſeth the Denſity of the Blood, even without increaſing its Celerity, heats, becauſe a denſer Body is hotter than a rarer. Extreme Cold at laſt heats. Cold in Animal Bodies is produc'd by Cauſes contrary to thoſe productive of Heat, as *Firſt*, by diminiſhing the force of any Stimulus, as by Whey, Milk, Water, *&c. Secondly*, By all Things which relax. *Thirdly*, Alkaline Subſtances in reſpect of Acid, and Acid in reſpect of Alkaline are cooling.

37. Cephalick are all ſuch Things as attenuate the Blood ſo as to make it circulate eaſily through the capillary Veſſels of the Brain. A Cordial properly ſpeaking is not always what increaſeth the Force of the Heart; for by increaſing that the Animal may be weaken'd as in inflammatory Diſeaſes. Whatever increaſeth the Natural or Animal Strength, the Force of moving the Fluids and the Muſcles is a Cordial, ſuch are ſuch ſubſtances, as bring the Serum of

the Blood in the propereſt Condition for Circulation and Nutrition, as Broths made up of Animal Subſtances, Milk, ripe Fruits, and whatever is endued with a wholeſome but not pungent Taſte. Whatever relaxes the too ſtrict, or ſtrengthens the too lax Fibres, what in ſome Caſes diſpels Wind, what excites and takes off the ſluggiſh Motion of the Animal Spirits, as Spices, Wine, and ſpirituous Liquors.

38. Carminative are ſuch Things as dilute and relax at the ſame time, becauſe Wind occaſions a Spaſm or Convulſion in ſome Part; whatever promotes inſenſible Perſpiration is Carminative, for Wind is perſpirable Matter retain'd in the Body.

39. All emollient relaxing Diet, and all things which deſtroy Acrimony, abate Pain.

40. There are ſeveral Things taken in Diet which kill Worms, as Oil, and Honey.

Whoever attends to the Particulars barely hinted at in this Chapter, will eaſily perceive that all the Intentions purſued by Medicines, may be obtain'd and inforc'd by Diet.

It may be expected that I ſhould ſay ſomething in this Chapter of the Qualities of three exotick Plants, whoſe Infuſions and Decoctions are now much us'd in common Aliment, Tea, Coffee, and Chocolate: There are many Treatiſes worte about them, which aſcribe to them both good and bad Qualities, which they have not. There is lately publiſhed a very learned and elaborate Diſſertation upon Tea, by Doctor *Thomas Short*, in which the Author with great Knowledge, Induſtry, and Skill, has not only given us the Natural Hiſtory of the Plant, but likewiſe its Analyſis.

But as the Infuſions and Decoctions of the foremention'd Vegetables in common Water, are the only Preparations of them in Uſe, there is no neceſſity in this Place of conſidering any of their Contents, but ſuch as are extracted by thoſe ſimple Operations of Cookery.

The green Leaves of Tea contain a narcotick Juice, which exudes by Roaſting. This is perform'd with great Care before it is expos'd to ſale. The ſeveral Methods of diſcovering the Adulterations of Tea by Copperas, Galls, Spirit of Harts-horn, one may ſee in the foremention'd Treatiſe. Tea by its manner of affecting the Organs of Taſte and Smell, contains very little of a volatile Spirit; its Roſin or fix'd Oil which is bitter and aſtringent, cannot be extracted by Water, but demands rectify'd Spirit. The active Principles of it extracted by Infuſion, are the moſt ſeparable Parts of its Oil or Gum, and its Salt.

Its Salt and Gum are aſtringent; chalybeat Water draws from it a Tincture of the ſame Colour as that from Oak Leaves. It is aceſcent as appears by its Effects upon Stomachs troubled with Acidity. So that Tea is an Infuſion of a Plant aceſcent, and moderately aſtringent in warm Water.

As a watery Liquor, it is diluting and ſtimulating by its Salt: By its aſtringent Quality it moderates the relaxing Quality of warm Water. By what has been ſaid before in this Chapter, Water endu'd with any ſaline ſtimulating Subſtance is very penetrating, and goes into the moſt inward Receſſes of the circulating Juices by its Quality, and refreſheth the Brain and Animal Spirits; but by its ſtyptick and ſtimulating Quality it affects the Nerves, very often occaſioning Tremors, by its Heat it promotes Perſpiration, by its watery Quality it diſſolves what is viſcid in the Stomach, and ſo may help Digeſtion; but a ſtrong Decoction of it is emetick, and drinking too great Quantities may relax and weaken the Tone of the Stomach.

As ſtimulating and diluting it is diuretick, but as it is aſtringent, it is not quite ſo proper where relaxing the urinary Paſſages is neceſſary.

Milk abates ſome of the foremention'd Qualities, making it more ſoft and nutritious, and Sugar as a Salt increaſeth its *Stimulus*. From thoſe Hints it follows, *Firſt*, That Tea is proper only for ſuch whoſe Bodies are in ſuch a State as demands ſome of the foremention'd Alterations. Who theſe are, will be ſhown more plainly in the following Chapter. *Secondly*, That the immoderate Strength and Quantity of this Liquor may be hurtful in many Caſes, and to moſt People.

Coffee has in common with all Nuts an Oil ſtrongly combin'd, and entangled with earthly Particles.

The moſt noxious Part of its Oil exhales in roaſting to the Abatement of near $\frac{1}{4}$ of its Weight.

* One Pound of Coffee by Diſtillations afforded of volatile Spirit, ſix Ounces ſix Drachms: of Oil, two Ounces, two Drachms, two Scruples: Of *Caput mortuum* five Ounces three Drachms. Tho' the Chymiſt did not, or could not calcine the *Caput mortuum* ſo as to obtain its fix'd Salt, to be ſure it muſt have ſome.

What is extracted by Water from Coffee, is the moſt ſeparable Parts of Oil which often ſwims a-top of the Decoction. This Oil is Volatile, and conſequently very little Nutritious.

Volatile Oils refreſh the Animal Spirits, but likewiſe are endued with all the bad Qualities of ſuch Subſtances, producing all the Effects of an oily and aromatical Acrimony mention'd in the following Chapter, as Dryneſs, Heat, Stimulation, Tremors of the Nerves, from whence it has been accus'd of cauſing Palſies, Leanneſs, Watchfulneſs, and deſtroying maſculine Vigour.

From theſe Qualities it is eaſy to imagine, that it muſt be hurtful to hot, dry, bilious Conſtitutions, and perhaps beneficial to Phlegmatick, and that drank in too great a Degree of Strength or Quantity hurtful to every Body.

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* *Vid.* Philoſ. Tranſact.

Chocolate is certainly much the beſt of thoſe three exotick Liquors, its Oil ſeems to be both rich, alimentary, and anodyne; for an Oil as ſoft as that of ſweet Almonds can be extracted from the Nut, and the *Indians* made Bread of it. This Oil combin'd with its own Salt and Sugar, makes it ſaponaceous and detergent, by which Quality it often helps Digeſtion and excites Appetite, when it is mix'd with Vanillios or Spices; it acquires likewiſe the good and bad Qualities of aromatick Oils, which are proper in ſome Caſes and Conſtitutions, and very improper in others.

CHAP. VI.

Of the different Intentions to be purſued in the Choice of Aliment in different Conſtitutions.

WHoleſome and unwholeſome are relative not real Qualities, therefore to affirm that ſuch a Thing is wholeſome or unwholeſome, without deſcribing the Subject in all its Circumſtances to which it bears theſe Relations, is, with Submiſſion talking Nonſenſe.

To make theſe Terms of wholeſome and unwholeſome Aliment intelligible, there are two Things neceſſary; *Firſt*, To ſhew what Aliment is proper for what Intention. *Secondly*, What Intention is proper to be purſued in ſuch a Conſtitution of a Human Body. The *Firſt* is the Subject of the foregoing Chapter, and the *Second* of this.

PROP. I.

To enumerate the moſt common Diverſities of the Conſtitutions of Human Bodies.

The moſt common Diverſities of Human Conſtitutions ariſe either from the ſolid Parts as to their different Degrees of Strength and Tenſion; in ſome being too lax and weak, in others too elaſtick and ſtrong; or from the different State of the Fluids, which, as they conſiſt of Spirit, Water, Salts, Oil and terreſtrial Parts, differ according to the Redundance of the whole, or of any of theſe Ingredients, and therefore are plethorick, phlegmatick, oily or fat, ſaline, earthy or dry by the Diſſipation of the moſt fluid Parts, which laſt Conſtitution is call'd, by the Antients, Atrabilarian or Melancholick. A plethorick Conſtitution in which true Blood abounds, is call'd Sanguineous. A ſaline Conſtitution is either Acid, Alkaline, or Muriatick, according to the Difference of the Salts which occaſion it.

2. In ſome of theſe Senſes, tho' every Human Conſtitution is morbid, yet are their Diſeaſes conſiſtent with the common Functions of Life, and leave them under their own Conduct as to their Manner of living, and therefore are a proper Subject for this Diſcourſe, in which I am far from pretending to inſtruct the Brethren of the Profeſſion, or anticipating their Directions to ſuch as are under their Government.

3. I think it proper to advertiſe the Reader of two Things. *Firſt*, That I endeavour to give the moſt ſimple Idea of the Diſtemper of the Conſtitution, and the proper Diet, abſtracting from the Complications of the Firſt, or the Contra-indications to the Second. *Secondly*, That in a Diſcourſe of this Nature, the Reaſonings muſt be preciſe, tho' the Practice may admit of great Latitude.

PROP. II.

To explain the Cauſes, Symptoms and proper Diet of ſuch as have weak and lax Fibres.

1. In all the Fibres of an Animal Body, and in the Sides of all the Canals, there is a contractile Power whereby the Fibres endeavour to ſhorten themſelves. This is evident; for if a Fibre be cut tranſverſly, both the Ends ſhrink, and make the Wound gape; the Force oppos'd to this contractile Power of the Fibres, is the influent Liquid. Health conſiſts in the *Equilibrium* between thoſe two Powers, when the Fluids move ſo equally, that they don't preſs upon the Solids with a greater Force than they can bear, and no more in one Part than in another; and on the other Hand when the Solids reſiſt, and act upon the Fluids ſo equally that there's no uneaſy Senſation, the Animal is in Health; on the contrary when ever this *Equilibrium* between the influent Fluids and Solids is taken away the Animal is in a morbid State; and whatever deſtroys it in any Point, deſtroys it in ſome meaſure thro' the whole Body.

2. The firſt and moſt ſimple Solids of our Body are perhaps merely terreſtrial, incapable of any Change or Diſeaſe; of theſe Elements are conſtituted the ſmalleſt Fibres, of thoſe Fibres the Veſſels, of thoſe Veſſels the *Viſcera* or Organs of the Body; therefore the Weakneſs and Laxity of the Fibres, Veſſels, Viſcera, and all Parts of the Body may be conſider'd as one Diſeaſe, tho' it muſt be own'd that the Diſeaſe is not always univerſal, and there will be ſometimes a Weakneſs in ſome Organ with a great Degree of muſcular Strength.

3. A Fibre is ſaid to be Weak when the Coheſion of its Parts is ſo ſmall that it may be broken, or reſolv'd by a Force not much greater than what happens commonly in the Body of a healthy Perſon:

ſon: Debility of the Veſſels or Organs is ſo ſmall a Coheſion of the conſtituent Parts as makes them unable to diſcharge the common Functions of Life, conſider'd in a State of Health. Tho' there is a Debility of Fibres in Infants abſolutely ſpeaking, yet it is no Diſeaſe, becauſe their Fibres being lax, lengthen by the Influx of the Liquids which is the Cauſe of their Growth; but in adult Perſons, when the Fibres cannot any more yield, they muſt either break or loſe their Spring.

4. Laxity of a Fibre is ſuch a ſmall Coheſion of its Parts, as ſuffers it to be lengthen'd by a ſmall Force: Laxity is a Species of Debility.

5. The moſt common Cauſes of Debility of Fibres are, *Firſt*, A Defect or great Loſs of the vital nutritious Juices: If there is not Blood enough the Chyle cannot be eaſily aſſimilated. A Perſon who loſeth daily great Quantities of Blood turns Dropſical and Leucophlegmatick. An elaſtick Fibre like a Bow, the more it is extended, reſtores itſelf with the greater Force; if the Spring be deſtroy'd, it is like a Bag only paſſive as to the Influx of the Liquid. *Secondly*, Nouriſhment too viſcid and glutinous to be ſubdu'd by the vital Force; of this Sort *Hippocrates* reckoned unfermented Bread. *Thirdly*, A ſedentary Life, for Motion increaſeth the Circulation of the Juices, and conſequently the Application of the ſolid Parts to one another. *Fourthly*, Too great an Extention of the Fibres by Plenitude; a Lute-ſtring will bear a hundred Weight without Rupture; but at the ſame time cannot exert its Elaſticity, take away fifty, and immediately it raiſeth the Weight. *Fifthly*, A moiſt Atmoſphere. The Atmoſphere is what keeps the Fibres of an Animal Body together, we feel our Fibres grow ſtrict or lax according to the State of the Air; many who live healthy in a dry Air, fall into all the Diſeaſes that depend upon Relaxation in a moiſt one. *Laſtly*, a natural Weakneſs from the Frame and Conſtitution of the Body.

6. The common Signs and Effects of weak Fibres are Paleneſs, Smoothneſs, Coldneſs of the Skin, Colour of the Blood not Florid (for what maketh that is a ſtrong action of the Solids) a weak Pulſe, Tumefactions in the whole Body or Parts, Stagnation of Humours, and its conſequence Putrefactions; for when the force of the Veſſels and Preſſure of the Air is taken off, all the Humours expand themſelves, and what ſtagnates muſt putrify; if a Perſon of a firm Conſtitution begins to bloat, and from being warm grows cold, his Fibres grow weak. Anxiety and Palpitations of the Heart are a ſign of weak Fibres: Acid Eructations upon taking Vegetable Food, or Nidoroſe upon taking Animal is a ſign of weak Organs of Digeſtion. Depravation of the Humours from a ſound State, to what the Phyſicians call by the general Name of a Cacochymy, Spots and Diſcolorations of the Skin are ſigns of weak Fibres; for the lateral Veſſels which lie out of the Road of Circulation, let groſs Humours paſs, which could not if the Veſſels had their due Degree of ſtricture. Atrophy as denoting a Deſtruction or Obſtruction of the Veſſels, which carry the Nouriſhment, and Dropſies proceed from a Laxity of the Fibres being too weak to return the Fluid.

7. It is evident that the Aliment of Perſons with weak Fibres, ought to be ſuch as requires but a ſmall force to convert it into Animal Subſtances, ſuch is that mention'd Chap. V. Prop. IV. V. Milk is the Chylous part of an Animal already prepar'd, the Cheeſy part is ſeparated and diſſolv'd by the Bile, and the more Serous and Spiritous Part enters into the Blood, meer Whey is too relaxing, Eggs taken warm from the Hen; for the moſt elaborate and ſpiritous Part is loſt in the dreſſing Broths made of Fleſh, which are the Nutritious Animal Juices ſeparated from the ſolid Parts. The Alkaleſcent Quality of them may be corrected, if neceſſa-

ry, by mixing them with ſome Acid. Decoctions, and Creams, or Gellies of well fermented Bread, (for Fermentation as was hinted Chap. III. Prop. IV. deſtroys the glutinous oily Viſcidity with which mealy Subſtances abound) auſtere Wines diluted with Water, which cool more than Water alone, and at the ſame time do not relax, Vegetables with an acid auſtere Juice mention'd Chap. V. Prop. IV. VIII. are all proper in this Caſe. Relaxations from Plenitude is cur'd by ſpare Diet, and from any Cauſe by that which is contrary to it. Care muſt be taken in contracting the Fibres, not to obſtruct the Veſſels.

PROP. III.

To explain the Symptoms, Cauſes, and proper Diet of ſuch as have too ſtrong and too elaſtick Fibres.

1. A State oppoſite to the former is too great Rigidity and Elaſticity of the Fibres, which is ſuch a Degree of Coheſion as makes them inflexible to the Cauſes, to which they ought to yield, ſo as to preſerve the Animal in Health: Too great Elaſticity is that Quality by which they not only reſiſt againſt Elongation, but reſtore themſelves with too great Preſſure and Force upon the moving Fluid.

Rigidity of the Organs is ſuch a State as makes them reſiſt that Expanſion, which is neceſſary to carry on the Vital Functions. Rigidity of the Veſſels and Organs muſt neceſſarily follow from Rigidity of the Fibres, both as the Fibres are their conſtituent Parts, and likewiſe becauſe by the ſtrong Force of the Heart and Motion of the Fluids, many of the Solids are compacted into one, and the Canals, through which they flow'd, aboliſh'd as by Prop. VII. Chap. II.

2. True Health conſiſts in ſuch a Flexibility of Fibres as yield to the Force of the Heart, ſo as to admit the influent Fluid, and then ſuch a due Spring to reſtore themſelves ſo as to drive it forward; for if the Canals were entirely rigid, or the Force of the Fibres in reſtoring themſelves were either in *Equilibrium* with, or exceeding that of the Heart, there could be no Circulation, even if the Veſſels drive back the Blood with too great a Force upon the Heart, it will produce Polypoſe Concretions in the Ventricles of the Heart, eſpecially when the Valves of the Heart are apt themſelves to grow too rigid, if but one Drop of Blood remain in the Heart at every Pulſe; thoſe in many Pulſes will grow to a conſiderable Maſs.

3. It is eaſy by the Laws of Hydraulicks to determine the natural Effects of ſuch a Conſtitution, which is the Parent of acute Diſeaſes, as Laxity of Chronical.

4. The Cauſe of ſuch a Diſeaſe beſides the Natural Conſtitution and Frame of the Body is too long a Continuance of ſuch Diet as ſtrengthens the Fibres, hard Exerciſe or Labour, ſuch as uſe it, according to *Hippocrates* are not eaſily cur'd of Pleuriſies; ſuch a Conſtitution is eaſily known by the outward appearances of the Body being lean, warm, hairy, ſcraggy, dry without a Diſeaſe, with hard and firm Muſcles, for the great Force by which the ſmall Veſſels reſtore themſelves, makes them grow narrow, expelling the Liquor they contain, and ſcarce admitting what is influent by which the Veſſels grow hard and contracted; laſtly by the Strength of the Pulſe, and the Force of the vital Actions.

5. The Rules of Diet for ſuch a Conſtitution may be drawn from Prop. IV. of the foregoing Chapter. *Firſt*, Abſtinence from things us'd in the contrary State of too great Laxity. Milk is too nouriſhing, but Whey proper as an Emollient. Auſtere and

ſtrong Wines are improper but much more ſo are inflammable Spirits which harden the Fibres; Water is the proper Drink being ſtrongly relaxing, there is no better way of ſupplying a Carcaſs than by drenching it in Water. All Emollient Nouriſhment, ſuch as Fruits which contain a Mucilage, and may be boil'd into Jellies. Pot Herbs of the Emollient kind, ſuch things as reſolve and cleanſe, that is take away any tenacious Solid which adheres to the Fibres, ſuch are Vegetable Soaps, the chief of which is Honey. The Animal Food ſhould be prepar'd in Broths rather than in any other form, all things which increaſe Fat, all oily Subſtances. The Animal Oils, Cream, Butter, Marrow, farinaceous Subſtances unfermented, as little Salt in the Aliment as poſſible, for Salt hardens.

6. From thoſe two Cauſes of the Laxity and Rigidity of the Fibres, the Methodiſts an ancient Set of Phyſicians deriv'd all Diſeaſes of human Bodies with a great deal of Reaſon, for the Fluids derive their Qualities from the Solids. There ſeems hardly any other Account to be given of the different Animal Secretions, than the different Configuration, and Action of the ſolid Parts, which from one Homogeneous Liquor, ſeparate ſo many various Fluids in an Animal Body; and I am of Opinion, that in moſt caſes where the Juices are in a morbid State, if one could ſuppoſe all the unſound Juices taken away, and ſound Juices immediately transfus'd, the Quality of the ſolid Parts remaining the ſame, after many Circulations the ſound Juices would grow morbid. The Methodiſts err'd in ſo far as they conſider'd the Diſeaſe inhering only in the Vaſcular Solids, and applied their Remedies chiefly to them, not reflecting that the Solids themſelves can be changed by working upon the Fluids.

PROP. IV.

To explain the Cauſes and proper Diet of Plethorick Conſtitutions.

The Diſeaſes of the Fluids are firſt a Plethora, or too great abundance of laudable Juices, the Cauſes of which are ſtrong Chylopoetick Organs, plenty of wholeſome Diet, a middle Age, ſanguineous Temperament (of which afterwards) Lazineſs or want of muſcular Motion, moiſt Air, Suppreſſion of uſual Evacuations. The Effects are Impatience of Heat or Labour, Extenſion of the greater Veſſels, Compreſſion of the leſſer, Lacerations upon ſmall Cauſes, a Stoppage of Circulation by too great a weight upon the Heart, Suffocation, *&c.* the Remedies for this Conſtitution are oppoſite to the Cauſes of it, ſpare Diet, Exerciſe and proper Evacuations, only it muſt be obſerv'd that Plethorick Bodies are not to be cur'd by long Abſtinence; becauſe in that caſe the moſt liquid parts fly off, and the groſſer remain: Blood-letting removes a Symptom, but often increaſes the force of the Chylopoetick Organs, and conſequently the Diſeaſe.

PROP. V.

To explain the Symptoms and proper Diet of ſanguineous Conſtitutions.

1. A ſanguineous Conſtitution (in the common Acceptation of the word) that is of a Perſon who abounds with blood is different from a Plethorick; the common outward Sign of ſuch a Conſtitution is a florid Appearance in the Countenance, a Blueneſs and Fulneſs of the Veins, Softneſs of the Fleſh, a particular, vivid, fair, but not pale Colour of the Skin, ſuch a Conſtitution with a great Appearance of Health is ſubject to many Diſeaſes.

2. The Blood as was obſerved, Prop. V. Chap. II. conſiſts of red Globules ſwimming in a thin Liquor call'd Serum, the red part is ſmalleſt in quantity. The red Globules are Elaſtick, and will break, one red Globule into ſix ſmall, and then they will turn yellow, thoſe yellow Globules break into others ſtill ſmaller, and then they grow more white and tranſparent; the Veſſels, which admit the ſmaller Globules, cannot admit the greater without a Diſeaſe. Therefore as the Blood paſſeth through narrower Channels, the Redneſs diſappears more and more. All the Chyle is white, and acquires this red Colour by Circulation. A free and ſtrong Projectile Motion of the Blood muſt occaſion a florid Appearance upon the Skin in ſuch Conſtitutions, becauſe a ſtronger Motion forceth the red part into more capillary Veſſels. To which likewiſe there is commonly another Cauſe that concurs, the greater Tranſparency of the Veſſels occaſioned by the Thinneſs and Delicacy of their Coats. That this is the Caſe of ſanguineous Perſons is plain from their great Veins appearing blue and tranſparent by the Colour of the Blood in them.

3. Therefore ſuch Perſons ſeem to be ſuſceptible of Diſeaſes, that depend upon a ſtrong projectile Motion of the Blood, and too great Thinneſs and Delicacy of the Veſſels; by the firſt they are ſubject to Inflammatory Diſtempers, for the greater Action or Reaction of the Fluids and Solids produceth a greater Attrition, to which Heat is proportional: This great Attrition muſt produce a great Propenſity to the putreſcent alkaline Condition of the Fluids, and conſequently to Suppuration: a ſtronger projectile Motion of the Blood, muſt likewiſe occaſion greater Secretions, and loſs of liquid Parts; and from thence perhaps Spiſſitude and coreaceous Concretions, which are always found in Animals that die of too ſtrong a Circulation.

If the Veſſels are in a ſtate of too great Rigidity ſo as not to yield, a ſtrong projectile Motion occaſions their Rupture and Hæmorragies, eſpecially in the Lungs, where the Blood is abundant; if the Veſſels inſtead of breaking yield, it ſubjects the Perſon to all the Inconveniences of an erroneous Circulation, (that is, when the Blood ſtrays into the Veſſels deſtin'd to carry Serum or Lymph, according to *Prop.* V. *Chap.* II.) From whence will follow Obſtructions and Inflammations, and as the Thinneſs and Delicacy of the Veſſels probably reigns through the whole Syſtem, it muſt affect the Glands and Lymphatick, as well as the Blood Veſſels; and ſuch Conſtitutions muſt be ſubject to glandulous Tumours and Ruptures of the Lymphatick, and all the Diſeaſes thereon dependent.

4. The natural Helps from Diet are firſt Moderation in the Quantity, and all things which relax the Veins; for what does ſo, prevents too vigorous a Motion through the Arteries: Therefore relaxing and cooling are proper intentions in the Diet, only where there are Signs of too great a Thinneſs in the Fluids. Subacid Subſtances are proper, though they are a little Aſtringent; for Perſons who take a great deal of Vinegar, abate their florid Colour, which is the Diſeaſe of ſuch a Conſtitution.

For ſuch Diet the Reader is referr'd to the foregoing Chapter.

A Saline Conſtitution of the Fluids is either Acid, Alkaline, or Muriatick, as in the Sea-Scurvy: Of theſe in their Turns.

PROP.

PROP. VI.

To explain the Symptoms, Cauſes, and proper Diet of Acid Conſtitutions.

1. It has been demonſtrated before, that the Juices of a ſound Animal, are neither Acid or Alkaline, by the Experiments mention'd *Chapter* IV. All the Subſtances Fluid, and Solid, of an Animal fed, even with aceſcent Subſtances, yield by Fire, nothing but Alkaline Salts. Thoſe Experiments which endeavour to ſhew the contrary, have been made upon Animals, which had taken much Sea-Salt, which is never totally changed in an Animal Body. The ingenious and learned *Boerhaave* fed a Sparrow with Bread four Days, in which time it eat more than its own weight, and yet there was no Acid found in its Body or Excrements. The reaſon of this is, that the vital Force of a ſound Animal is capable to tranſmute the Acid Subſtances it takes in Aliment, into ſoft nutritious animal Liquids by its vital Force (by which is underſtood the ſum of all thoſe Powers in an Animal Body, which converts its Aliment into Fluids of its own Nature) a Cow fed with Trefoil, Daiſies, Sorrel, gives Milk, in which there is not the leaſt Acidity; but if this vital Force is weak, it is inſufficient to ſubdue the Acidity of the Subſtances taken by the Mouth. The Liquors, which are made of fermented Plants, as Wine and Malt Liquors ſtanding in a Heat not greater than that of a human Body, turn ſour; and ſo they will in a human Body that has not ſufficient vital Force to change them, which makes no more alteration in ſuch Subſtances, than a Veſſel with the ſame degree of Heat and Moiſture. Thus weak Stomachs vomit up the Wine that they drink in too great Quantities to be digeſted, in the form of Vinegar. Put Bread into the Stomach of a dying Man, and it will follow its own Nature,

and undergo the Alteration that is merely the Effect of Heat. A weak Stomach will turn Rye-Bread into Vinegar, and a Plough-Man will digeſt it. Mealy Subſtances fermented turn ſour, and unfermented Being mix'd with a ſmall Quantity of Water, they turn viſcid, and then hard like Stones: accordingly given to a weak Child they ſtill retain their Nature: for Bread will give him the Cholick, and unfermented farinaceous Subſtances will fill his Belly with a viſcous Humour.

2. As no Acid is naturally in an Animal Body, but muſt be taken in by the Mouth; ſo if it is not ſubdu'd in the Paſſages of the Chyle, it may get into the Blood; and if there is not a ſufficient Quantity of Blood, and ſtrength of Circulation to ſubdue it, it may infect the whole Maſs of the Fluids; but this is a morbid State. The Experiments made upon Chyle have never diſcover'd any Acidity in it; but the Subject of theſe Experiments has been always the Chyle of healthy Animals.

3. The firſt and principal Seat of Acidity is the Stomach; this Quality of the Chyle is in ſome meaſure taken off in the *Duodenum*, and by the Mixture of Bile with it, grows leſs in the other Parts of the Alimentary Duct, and ſtill leſs in the Thoracick Duct, becauſe great Quantities of Animal Liquors have been mix'd with it; but at laſt it may (as was ſaid before) infect the Blood: Thus it is found by Experience, that the Sweat is ſometimes acid, which is a Sign of Recovery after acute Diſtempers, where the Blood was in the contrary alkaleſcent Diſpoſition.

4. The Antecedent Concomitants and Effects of ſuch a Conſtitution, are Acids taken in too great Quantities: Sour Eructations, a craving Appetite, eſpecially of terreſtrial and abſorbent Subſtances, the Caſe of Girls in the Green Sickneſs, Sourneſs in the Stomach, Pain in the Stomach (which tho' ſometimes occaſion'd by an acrid Bile, this

Cauſe may be diſtinguiſh'd by the Abſence of other Symptoms) colical Pains about the Navel, the *Weſt-India* dry Gripes are perhaps occaſion'd by the too great Quantities of Acids, as Lime-Juice in Punch. The Colicks of Infants proceed from Acidity, and the Air in the Aliment expanding itſelf while the Aliment ferments; for Oil of Vitriol will throw the Stomach into involuntary Contractions, inactivity and change of colour in the Bile; for Acids change the colour and conſiſtence of it. Bile is the chief Inſtrument of Digeſtion, and as was ſaid before, *Prop.* V. *Chap.* I. can attenuate the cheeſy Subſtance in the Stomach of a Calf, and render it fluid; hence billious Conſtitutions eaſily digeſt Cheeſe, a ſour Smell of the Fæces (when the Bile is redundant, they ſmell cadaverous) acid Sweats, Paleneſs of the Skin; for as was obſerv'd before, taking much Vinegar will make the Lips pale. It is poſſible that Tumours in the Breaſts may be the Effect of Acidity in the Milk, and Convulſions in Infants may be occaſion'd from Acidity paſſing into the Blood, and affecting the tender Fibres of the Brain. Some Sorts of cutaneous Eruptions are occaſion'd by feeding much on acid unripe Fruits, and farinaceous Subſtances.

5. Acidity, as it is not the natural State of the Animal Fluids, but induc'd by Aliment, is to be cur'd by Aliment, with the contrary Qualities; for which the Reader is referr'd to the foregoing Chapter. Anti-acid Medicines are ineffectual without a Diet of the ſame Kind; all Animal Diet is Alkaleſcent, eſpecially ſuch as feed upon other Animals, as Inſects, Fiſh; and eſpecially Shell-Fiſh. Acidity in the Infant may be cur'd by a Fleſh-Diet; in the Nurſe. There are a great many anti-acid Vegetables which do not eaſily ferment, but putrify, as all the warm Anti-ſcorbuticks: Selery, Aſparagus, Cabbage, Turnips, Carrots, Onions, Leeks, Radiſhes, Muſtard, Eringo-Roots and Nettles, are

Anti-acid. In Caſes of Acidity, Water is the proper Drink, its Quality of relaxing too much may be corrected by boiling it with ſome Animal Subſtances, as Ivory, Harts-horn: Abſtinence from fermented Liquors is neceſſary.

6. This Diſtemper is moſt incident to Children, becauſe of the Debility of their Fibres and Milk-Diet, to ſuch as lead a ſedentary Life, to thoſe who take much Bread and Wine, and vegetable Acids, to Girls diſpos'd to the Green-Sickneſs, and to Artificers who deal in the Preparations of Acids, as Diſtillers, Dyers.

PROP. VII.

To explain the Symptoms, Cauſes, and proper Diet of Conſtitutions, which abound with a ſpontaneous Alkali.

1. A Conſtitution oppoſite to the former is that which abounds with a ſpontaneous Alkali. No Animal unputrify'd being burnt, yields any alkaline Salt, but putrify'd yields a volatile Alkali, therefore in a healthy Animal no true Alkali is found; but as an Animal degenerates from this State, by ſuch Diſeaſes as increaſe the Attrition and Heat of the Fluids, the Animal Salts formerly benign approach towards an alkaline Nature. Human Blood, when it is firſt let, is mild, and will not make the Eye or a freſh Wound ſmart. Let it ſtand in a Degree of Heat equal to that of a Human Body, it will grow in three Days, fetid, the Salt of it volatile and alkaline fermenting with Acids, the Oil that remains volatile and rancid; the Blood in the Veſſels may at laſt arrive at the ſame State, but muſt paſs thro' infinite Degrees, and before it comes to the laſt, the Animal will be deſtroy'd. All Animal Subſtances expos'd to the Air turn Alkaline of their own accord, and ſome Vegetables by Heat will not turn acid but alkaline: Every Plant in that State of Putrefaction by

Prop. III. *Chap.* I. is converted as it were into an Animal Subſtance, by Chymical Trials yielding the ſame Contents.

2. The Cauſes of ſuch a Diſtemper, is a Diet of alkaleſcent Subſtances. If a Woman ſhould live upon Vegetables, Bread, and fermented Liquors, her Milk would be aceſcent or ready to turn ſour; if only on Animal Food her Milk wou'd be apt to turn fetid and putrid, but not ſour.

If it was poſſible to take Muſtard in great Quantities, it would quickly bring the Blood into this alkaline State, and deſtroy the Animal; the warm antiſcorbutical Plants taken in Quantities will occaſion ſtinking Breath, and corrupt the Blood. All Animals that live upon other Animals have their Juices more alkaleſcent than ſuch as live upon Vegetables, and for that Reaſon perhaps Fiſhes have this Quality more than terreſtrial Animals; for in the open Air they putrify ſooner, by what was ſaid *Prop.* I. *Chap.* IV. An Animal with a ſtrong vital Force of Digeſtion will turn Acids into Animal Subſtances; but if its Food be intirely alkaleſcent, its Juices will be more ſo. No Perſon is able to ſupport a Diet of Fleſh and Water without Acids, as Salt, Vinegar, and Bread, without falling into a putrid Fever. If his Diet conſiſted of Snails, Fiſh, eſpecially their Livers, Shell-Fiſh, Vipers, ravenous Birds, as ſome who feed upon Inſects and alkaleſcent Vegetables, the Effect would happen ſooner. Eggs and *Spaniſh* Wines, taken in great Quantities without Exerciſe, will occaſion a Fever. Abundance of good Blood and laudable Juices diſpoſe towards this alkaleſcent State. Likewiſe long Abſtinence, (by which the Fluids are depriv'd of a Dilution of the cooling Emulſion of freſh Chyle. See *Prop.* VIII. *Chap.* II.) great Strength of the Bowels, and a right State and Abundance of Bile. Bile is an anti-acid. Another Cauſe is a vigorous Action of the Veſſels, through which the

Juices circulate; which is the Reaſon ſtrong healthy and young People are more in peril by peſtilential Fevers, than the Weak and Old.

Violent Animal Motion produceth this alkaline State. Two hard Bones rubb'd hard againſt one another, or with a File, produce a fetid Smell. It is poſſible to produce a Gangrene by ſtrong Friction, and yet Stagnation of the Fluids turns them putrid.

The Effects of ſuch an alkaleſcent State in any great Degree, are Thirſt, and a Dejection of Appetite, which putrid Things occaſion more than any other; (thoſe who are troubled with Acidity have often a bad Digeſtion, but a craving Appetite nidoroſe Eructations, which are different from acid. Foulneſs of the Tongue and Palate, a bitter and hot Taſte in the Mouth, Thirſt, Sickneſs, Loathing, bilious Vomitings and Dejections of a cadaverous Smell, iliacal Pains with Heat. Theſe are the Effects of it in the alimentary Diet. Such a State diſſolves the Blood, and diſpoſeth it towards Putrefaction, hinders Nutrition; for no Chicken can be hatch'd of a rotten Egg, the Blood turning acrimonious corrodes the Veſſels producing Hemorrhages, Puſtules red, lead-colour'd, black and gangrenous, and almoſt all Diſeaſes of the inflammatory Kind.

3. The Aliment of ſuch Perſons ought to be aceſcent Subſtances, as Bread, Vinegar, ſuch as are deſcrib'd in the foregoing Chapter. Acids keep Animal Subſtances from Putrefaction; for neither Blood, Fleſh or Fat will putrify in Vinegar or ſour Wine: The Effect of the ſtrongeſt Acids, even Oil of Vitriol in putrid Fevers, is known by Experience, in which your alkaline Spirits muſt be hurtful, farinaceous Things, eſpecially ſuch as are made of Oats, are proper as having an aceſcent Quality; it is a common Miſtake that People in ſuch a State ſhould forbear Wine. Thin Wines, as Rheniſh, Moſelle mix'd with Water are proper

in a Fever. But when the Diſtemper is attended with great Heat, Milk mixed with Water is the propereſt Drink. The propereſt Seaſoning is Salt-petre; Sea-ſalt creates Thirſt, Water is the only Diluent; but as it has no Acidity in it, it is better mix'd with Limon, or with the Rob or Jelly of ſome acid Fruit, ſometimes the demulcent Aliment mention'd *Prop.* IV. of the foregoing Chapter, will be of great Uſe.

The muriatick Scurvy induced commonly by too great Quantity of Sea-Salt, and common among Mariners, is rather an artificial than a natural Diſeaſe, ſpontaneous only in few who have a great Diſpoſition towards it. Its common Symptoms are a ſaline Taſte in the Spittle, Itching and red Eroſions of the Skin, great Thirſt, Dryneſs of the Skin, a lixivial Urine ſometimes with a fatty Subſtance like a thin Skin a-top, Relief from watery and acid Subſtances. The Cure of this Diſtemper lies in a Diet of freſh unſalted Things, watery Liquors acidulated, farinaceous emollient Subſtances, ſour Milk, Butter-Milk, acid Fruits, and avoiding of the hot Antiſcorbuticks of the Muſtard Kind, the Rule of Diet is not much different from that in the alkaline Scurvy before mention'd.

5. It is of great Importance to know whether cutaneous Diſtempers proceed from an acid or alkaline Cauſe, becauſe, according to the difference of the Cauſe, there muſt be quite oppoſite Methods of Cure; they may be diſtinguiſh'd firſt by the difference of the Diet that occaſion'd them, crude Aliment, farinaceous Subſtances, unripe Fruits, and other Aceſcents will ſometimes produce the Scurvy and Itch, and even Leproſies depending on the ſame Cauſe, in which volatile Salts, and ſuch as are taken from Animal Subſtances are indicated. *Secondly*, From the Abſence of the concomitant Symptoms of the one, and the other: in the acid Acrimony, there is not Thirſt, Heat, nor ſo great a De-

a Dejection of Appetite as in the Alkaline. *Thirdly*, The Eroſions of the Skin are not of ſo deep a Colour in the Acid as Alkaline. In general, an Attention to the Symptoms before enumerated may be a Guide to the Diet.

6. Another Conſtitution of the Fluids of a Human Body, may be properly call'd Glutinous or Phlegmatick; Phlegm amongſt the Antients ſignified a cold viſcous Humour contrary to the Etymology of the Word which comes from φλέγω, to burn; but amongſt them there were two Sorts of Phlegm, cold and hot. A cold Tumor they call'd ſimply Phlegmonem; when it came from glutinous Blood, they call'd it Phlegmonem Phlegmenodem.

7. Phlegm or Pituite is a Sort of ſemi-fluid, it being ſo far ſolid, that one Part draws along ſeveral other Parts adhering to it, which doth not happen in a perfect Fluid, and yet no Part will draw the whole Maſs, as happens in a perfect Solid.

8. The Pituite or Mucus ſecern'd in the Noſe, Mouth, Palate, Stomach, Inteſtines, and Wind-Pipe, is not an excrementitious but a laudable Humour, neceſſary for defending thoſe Parts from which it is ſecern'd, from Excoriations, as happens in the Noſe, when the Pituite is too thin. The Want of it in the Wine-Pipe occaſions Hoarſeneſs, in the Gullet and Difficulty of Swallowing. The Pituite defends the Inteſtines from the Acrimony of the Ingeſta, and lubricates the Extremities of the Joints. Therefore thoſe are miſtaken who imagine that Phlegm cannot be too much purg'd off; but when the Phlegm is either too viſcous, or ſeparates in too great a Quantity, it brings the Body into a morbid State; this viſcous Phlegm ſeems to be the vitrious Pituite of the Antients.

9. The firſt Seat of it is the alimentary Duct where it creates Crudity, Dejection of Appetite, a Senſe of Repletion and Sickneſs; for it hinders the natural Contraction of the Fibres, and that Senſe

of Irritation which produceth Hunger. A Senſation of Fulneſs without eating is a ſure Sign of a phlegmatick Stomach. In the Inteſtines it occaſions a Tumour of the Belly, with an Atrophy in the reſt of the Body; for the viſcous Cruſt ſtops the Entry of the Chyle into the Lacteals. The Caſe of rickety Children. In the Body it often affects the Lungs, Phlegm may be ſo concocted in the Lungs by the Evaporation of its moſt liquid Parts as to ſhut up the Paſſages of the Bronchea, and it makes Paleneſs in the Skin; for as it was obſerv'd before, our Aliment in the form of Chyle before it circulates with the Blood is whitiſh, by the Force of Circulation, it runs through all the intermediate Colours, till it ſettles in an intenſe Red; as much as the Force of Circulation is deficient, ſo much will the Blood fall ſhort of that florid Colour, and Perſons in that Condition are call'd Leucophlegmatick; from this Phlegm proceed white cold Tumors, Viſcidity, and conſequently Immeability of the Juices; hence Lethargies in old People.

10. The Cauſes of this phlegmatick Conſtitution are, *Firſt*, Viſcid Aliment as of unripe Fruits, farinaceous Subſtances unfermented and taken in great Quantities. The Flowers of Grains mix'd with Water will make a ſort of Glue, Meals have an Oil in them which makes their Parts adhere. *Secondly*, Great Loſs or Want of Blood which is a natural Soap, preſerving itſelf and the Aliment from Coagulation by conſtant Motion. *Thirdly*, Weakneſs and Indigeſtion in the alimentary Duct which leaves the Aliment viſcous. *Fourthly*, A Defect or bad Conſtitution of the Bile (which is the chief Reſolvent of the Aliment) phlegmatick and bilious Conſtitutions are oppoſite. *Fifthly*, Diſſipation of the moſt fluid Parts by Heat or ſome great Evacuation, therefore profuſe Sweats, and Fluxes of Urine diſpoſe towards this Conſtitution by thickening the Phlegm. *Sixthly*, Stagnation

from the Debility of Inſtruments of Excretion, for if the Pituite ſtagnates, it muſt grow viſcid from Heat. Theſe are the Cauſes and Symptoms of a phlegmatick cold Conſtitution, but Spiſſitude attended with Heat, grows inflammatory.

11. The Symptoms point to the Cure. All the Methods of attenuating, mention'd *Chap* V. *Prop.* IV. well fermented Bread, and well fermented Liquors, Fermentation deſtroys the Viſcidity of farinaceous Subſtances. High ſeaſon'd Aliment is proper for Phlegmaticks. Spices, Onions, Garlick, diſſolve Viſcidity. Water impregnated with ſome ſtimulating Subſtance which both dilutes and attenuates. Hot Mineral Waters are the beſt Diſſolvers of Phlegm. All Sorts of Nouriſhment which promote Heat, and a vigorous Motion of the Blood, and for that Reaſon Broths made of the moſt volatile and alkaleſcent Parts of Animals.

12. A Diſeaſe oppoſite to this Spiſſitude is too great Fluidity, the Symptoms of which are Exceſs of Animal Secretions, as of Perſpiration, Sweat, Urine, Liquid, Dejectures, Leanneſs, Weakneſs, and Thirſt. The Methods in ſuch a Caſe muſt be oppoſite to the former. Farinaceous Subſtances, and watery Liquors, unfermented Gellies of Animal and Vegetable Subſtances, all ſuch Things as are deſcrib'd *Prop.* IV. *Chap.* V.

13. Another Conſtitution is the oily or fat; Animal Fat is a Sort of amphibious Subſtance, it is ſciſſile like a Solid, reſolvable by Heat not greater than what is incident to Human Bodies circumſcrib'd and contain'd in proper Veſſels, like a Fluid. The Symptoms of this Conſtitution are too manifeſt to want a Deſcription, it co-incides often with the plethorick and phlegmatick Conſtitutions above deſcrib'd. It is but one Species of Corpulency, for there may be Bulk without Fat, from the great Quantity of muſcular Fleſh, the Caſe of

robuſt People. An Animal in the Courſe of hard Labour ſeems to be nothing, but Veſſels, Bones and muſcular Fleſh. Let the ſame Animal continue long in Reſt, it will perhaps double in Weight and Bulk. This Superaddition is nothing but Fat or Oil, and in this Senſe an Animal perhaps never arrives at its full Growth.

14. The common Cauſes of this Diſtemper are a particular, and perhaps a gentilitious Diſpoſition of Body, which ſeems to conſiſt in the Chylopoetick or Organs of the firſt Digeſtion being ſtrong, and the Fibres of the circulating Veſſels, eſpecially thoſe about the *Panniculus carnoſus* being lax, according to the Doctrine of the Second Chapter. By the Action of the Fibres of the Veſſels upon the Fluids the oily Parts of the Chyle are intimately mix'd with the Blood, which by *Prop.* III. *Chap.* II. will ſwim a-top of it ſeveral Hours after Repaſt; when this Action is not ſtrong enough, and the Chyle extremely copious, perhaps the thicker Oil is never entirely ſubdu'd; ſome Sorts of cramm'd Fowl have always a milky Juice ſwimming a-top of their Blood. *Secondly*, Quantities of oily Nouriſhment, Milk, Butter, and oily fermented Liquors. *Thirdly*, All Things which occaſion Coldneſs in the Skin ſo as to ſtop Perſpiration, by which the oily Parts are congeal'd, which Heat reſolves and attenuates. The Inhabitants of cold moiſt Countries are generally more fat than thoſe of warm and dry; but the moſt common Cauſe is too great a Quantity of Food, and too ſmall a Quantity of Motion, in plain *Engliſh*, Gluttony, and Lazineſs. I am of Opinion that ſpare Diet and Labour will keep Conſtitutions, where this Diſpoſition is the ſtrongeſt, from being fat. You may ſee in an Army forty thouſand Foot-Soldiers without a fat Man amongſt them; and I dare affirm that by Plenty and Reſt, twenty of the forty ſhall grow fat.

15. The Oil in Animals is neceſſary for many Purpoſes; in all for Motion, in ſome for Nouriſhment; ſuch accumulate Fat in the Summer which ſerves to refreſh the Blood in the Penury of Aliment during the Winter, and for that purpoſe ſome Animals have a quadruple Omentum. But the too great abundance of Fat ſubjects Human Conſtitutions to the following Incoveniencies.

16. *Firſt*, It hinders the Motion of the Joints by making them more heavy by filling the Spaces, occupy'd by the Muſcles when they contract and ſwell. *Secondly*, It ſubjects them to all the Diſeaſes depending upon a defective projectile Motion of the Blood; for the Blood flows through the Veſſels by the Exceſs of the Force of the Heart above the incumbent Preſſure, which in fat People is exceſſive; and as want of a due Quantity of Motion of the Fluids increaſeth Fat, the Diſeaſe is the Cauſe of itſelf. *Thirdly*, To Suppurations, of which the *Membrana adipoſa* is the chief Seat. *Fourthly*, To danger in inflammatory Diſtempers, a Fever reſolves many Things which ſtagnate, and amongſt others the Fat, which being mix'd with the Blood turns volatile, and occaſions an Acrimony much more dangerous than the ſaline; for Salts can be diluted with Water which Oils cannot. That the Fat is diſſolv'd by Fevers, is evident from the great loſs of Fat, which People undergo in Fevers. Amongſt thoſe and many other bad Effects of this oily Conſtitution, there is one Advantage that ſuch of them who arrive to an advanc'd Age, are not ſubject to the Stricture and Hardneſs of Fibres, the Effect of old Age.

17. The Cauſes above mention'd lead directly to the Cure; as it is the Product of Gluttony and Lazineſs, Exerciſe and Abſtinence is the Antidote; it has been obſerv'd that a feveriſh Heat reſolves Fat, and therefore what produceth this Ef-

fect in a ſmall Degree ſo as not to endanger the Life of the Patient, muſt be proper, ſuch are all acrid and ſtimulating Subſtances. Salt, Pepper, Garlick, Onions, Vinegar, *&c.* taken in Quantities will produce a momentary Fever. Salt taken in great Quantities will reduce an Animal Body to the great Extremity of Aridity or Dryneſs. The Ancients were ſo ſenſible of the Force of Stimulating in this Caſe, that the celebrated Remedy againſt Fat was a certain Quantity of the Vinegar of Squills taken every Morning; for the ſame Reaſon, ſaponaceous Subſtances, as Sugar, Honey, the Juices of ripe Fruits, Pot Herbs with Abſtinence from fat Meat, and even an entire Milk-Diet by its Thinneſs are very effectual. Unfermented watry Liquors are hurtful only as they relax, but on the other hand Quantities of oily fermented Liquors commonly increaſe the Diſeaſe. All Things which promote the Animal Secretions, eſpecially Sweat, and inſenſible Perſpiration, and for that Purpoſe even Water taken in Quantities is ſometimes uſeful. Salts mix'd with Fat harden it, and acid Things congeal Oil; Spirit of Nitre will turn Oil of Olives into a Sort of fatty Subſtance; but Acids may be us'd as ſtimulating. If acid Things were us'd only as Coolers, they would not be ſo proper in this Caſe, in which it is neceſſary to keep up a conſiderable Degree of Heat; but for their foremention'd Qualities they are ſtrongly indicated in the inflammatory Diſtempers of fat People, where the Oil diſpoſeth to a rancid Putrefaction; but Abſtinence being the chief diutetick Method of preventing or curing the Diſeaſe, leads me to ſay ſomewhat of the Quantity of Aliment in general.

18. By *Prop.* VIII. *Chap.* II. The frequent Repetition of Aliment is neceſſary, not only for repairing the Fluids and Solids, but to keep the Fluids from the putreſcent alkaline State, which

they acquire by conſtant Attrition without being diluted; from whence it follows, *Firſt*, That long Abſtinence may be the Parent of great Diſeaſes, eſpecially in hot bilious Conſtitutions, and extremely painful to acid Conſtitutions by the uneaſy Senſation it creates in the Stomach. *Secondly*, That the Quantity of Aliment neceſſary to keep the Animal in a due State of Vigour, ought to be divided into Meals at proper Intervals in the natural Day, by which Method neither the chylopoetick Organs, nor the Blood-Veſſels are overcharg'd, nor the Juices depriv'd too long of freſh Recruits of Chyle. *Sanctorius* confirms this Maxim in his Doctrine of Perſpiration.

19. The great Secret of Health is keeping the Fluids in due Proportion to the Capacity and Strength of the Channels through which they paſs; but the Danger is leſs when the Quantity of the Fluid is too ſmall; than when it is too great, for a ſmaller Quantity of Fluid will paſs where a larger cannot, but not contrariwiſe.

20. When the Quantity of the Fluid is too ſmall, the elaſtick Power of the Canal (in which Life conſiſts) exerts it ſelf with too great a Strength upon the Fluid. In which Caſe there muſt follow too great a Diſſipation of the Fluid, Dryneſs and a gradual Decay. In too great Repletion either the elaſtick Force of the Tube is totally deſtroy'd; or if it continue proportional to the Degree of Extenſion like a Bow too ſtrongly drawn, it throws the Fluid with too great a projectile Force forward through the Veſſels, and back upon the Heart, and ſubjects the Animal to all the Diſeaſes depending upon a Plethory, and may bring it into immediate Danger. Therefore the Diſeaſes depending upon Repletion are more acute and dangerous than thoſe that depend upon the contrary State. The Inſtances of Longevity are chiefly amongſt the Abſtemious.

ſtemious Abſtinence in Extremity will prove a mortal Diſeaſe, but the Experiments of it are very rare.

21. Such as have an imperfect Circulation through any Organ of the Body, ſhould never charge their Veſſels with too great a Quantity of Chyle, this was obſerv'd *Prop.* II. *Chap.* II. of the Lungs, and is equally true in any other Caſe, as in Head-aches, which eating little relieves, and eating and drinking much occaſion. A Senſation of Drouſineſs, Oppreſſion, Heavineſs and Laſſitude are Signs of a too plentiful Meal, eſpecially in young People.

22. The Meaſure of inſenſible Perſpiration diſcover'd by weighing is the beſt Rule of Diet; therefore in fat People the Uſe of vaporoſe or perſpirable Food, and exerciſe (both which increaſe Perſpiration) are proper.

23. The Conſtitution of the Air diſpoſeth the Inhabitants of one Country more to be fat than that of another, *Sanctorius*'s Experiment of Perſpiration being to the other Secretions as 5 to 3 does not hold in this Country, except in the hotteſt Time of Summer; ſo that the Action of *Paduan* Air in promoting Perſpiration the whole Year round, is equal to ours in the Month of *Auguſt*.

24. From the foregoing Doctrine, a common Caſe both of fat and lean Men having great Stomachs may be accounted for: by the laſt having a great Perſpiration, and ſome of the perſpirable Matter in the firſt not ſufficiently attenuated, ſtopping at the Surface of the Skin, and as it were carried about him. Hunger is only a Warning of the Veſſels being in ſuch a State of Vacuity as to require a freſh Supply of Aliment, after Secretions, the Veſſels of the fat and lean Man are equally empty; for the Fat is as much out of the Thread of Circulation as what is evaporated, and perhaps the Fat in that Caſe becomes like a

morbid Excreſcence, requiring a ſuperfluous Nutrition.

25. Infants and old People ſupport Abſtinence worſt. The firſt from the Quantity of Aliment conſum'd in Accretion, the laſt from their Weakneſs, and the ſmall Quantity of Aliment taken at once. The Middle-aged ſupport it the beſt, becauſe of the oily Parts abounding in the Blood.

26. From the foregoing Principles follow naturally the Hippocratical Rules of Diet in Fevers, of giving more or leſs, more thick, or more thin Aliment, according to the foreſeen time of the Duration of the Fever; for Example, in an Ephemera none, becauſe of its Termination in one Day, in a Fever of four Days Duration leſs than in one of eight. And as the Fever comes to its Height ſtill ſubſtracting from the Quantity of Aliment, and making it more diluent and thin.

27. We come now to what we may call the earthy or atrabilarian Conſtitution, where the ſpirituous and moſt fluid Parts of the Blood are diſſipated, that is the Spirit, Water and ſubtile Oil ſo much evaporated, as to leave the Salts, Earth, and groſſer Oil in too great a Proportion. The Blood grows darkiſh and thick, ſuch a Conſtitution the Ancients call'd Atrabilarian or melancholick: Melancholy, ſignifying in *Greek*, black Gall; whether there be any ſuch Humour as black Gall, is only a Diſpute about Words. *Hippocrates* gave ſuch an Humour this Name, and that is ſufficient; beſides it is matter of fact, that in the Extremity of this Diſeaſe, the Gall itſelf will turn of a blackiſh Colour, and the Blood verge towards a pitchy Conſiſtence.

28. The Signs of a Tendency to ſuch a State, are Darkneſs or Lividity of the Countenance, Dryneſs of the Skin, Leanneſs, a penetrating quick Genius, a ſlow Pulſe and Reſpiration. The Cauſes of it are all ſuch as expel the moſt volatile Parts

of the Blood, and fix the Reſidue: Great Applications of the Mind to one Object, either ſuch as produce Sadneſs or great Joy, both which equally diſſipate the Spirits, and immoderate Exerciſe in hot Air with unquench'd Thirſt: Aliments of hard Digeſtion, as dry'd and ſalted Fleſh, unripe Fruits, farinaceous Subſtances unfermented, and likewiſe immoderate Uſe of ſpirituous Liquors.

The Effects of ſuch a vapid and viſcous Conſtitution of Blood, are Stagnation, Obſtructions, Acrimony, Putrefactions, Viſcidity, and imperfect Secretion of the Gall, a defective Circulation, eſpecially in the lateral Branches deſtined to ſeparate the more fluid Parts, and therefore viſcous, and ſparing Secretions in the Glands: The Blood moving too ſlowly through the celiack and meſenterick Arteries, produce various Complaints in the lower Bowels and Hypochondres; from whence ſuch Perſons are call'd Hypochondriack: Such as Senſation of Weight, Anxiety and Repletion, a bad Digeſtion; from whence different Kinds of Aliment acquire ſuch a State as they affect of their own Nature, aceſcent, if the Diet is of acid Vegetables, and alkaline or nidoroſe, if of Animal Subſtances, eſpecially Fat, which remains rancid ſo as the Spittle will ſometimes flame in the Fire. This Indigeſtion proceeds from the Inactivity of the Gall, which likewiſe occaſions a Conſtipation of the Belly, and a Difficulty of being purg'd. The Urine is ſometimes limpid, ſometimes thick, which latter is often a Sign of Recovery. The Obſtruction of the Pituite in the lower Belly, forceth it upon the ſalivary Glands, and produceth Spitting.

29. Such a State of the Fluids at laſt affects the tender capillary Veſſels of the Brain by the Viſcidity and Immeability of the Matter impacted in them, and diſorders the Imagination, and at laſt

produceth Corruption in the Bowels of the lower Belly.

30. It is plain, that the Removal of ſuch a Diſeaſe is not to be attempted by active Remedies, any more than a Thorn in the Fleſh, or pitchy Matter adhering to a Thread of Silk is to be taken away by Violence; what is viſcid, ought to be gently attenuated, diluted and carried off. That all Subſtances, which do heat, will ſtill diſſipate the Fluid Parts more, and conſequently increaſe the Diſeaſe. Therefore Water impregnated with ſome penetrating Salt, is found to have great Effects in this Diſtemper. The Diet ought to be oppoſite to the particular Acrimony, whether acid or alkaline, which it is eaſy to gueſs at by No. 5. of this Propoſition. It ought to be demulcent, in both Caſes light, and of eaſy Digeſtion, moiſtening and reſolvent of the Bile; of ſuch Nature are vegetable Soaps, as Honey, and the Juices of ripe Fruits, ſome of the cooling, lacteſcent, papeſcent Plants, as Cichory, Lettuce, Dandelion, which are found effectual in hot Countries. The Diet proper for all the Intenſions in this Caſe, the Reader may ſee in the foregoing Chapter.

PROP. VIII.

To draw a few general Inferences from the foregoing Doctrine.

From the Doctrine of this ſhort Eſſay, it is as eaſy to determine the Rules of Diet in the different natural States, as in the different morbid States of a Human Body.

1. By *Prop.* VII. *Chap.* II. Infancy and Childhood demand thin copious nouriſhing Aliment, ſuch as lengthens their Fibres without breaking or hardening, becauſe of their Weakneſs and State of Accretion. Milk has all thoſe Qualities.

2. By *Prop.* IV. *Chap.* II. The Solidity, Quantity and Strength of the Aliment is to be proportion'd to the Labour or Quantity of muſcular Motion, which in Youth is greater than any other Age, upon which Account a ſtrong and ſolid Diet would ſeem to be indicated; but as that Age is ſtill in a State of Accretion, their Diet ought ſtill to be emollient, and relaxing, copious, and without Acrimony.

3. The Diet of a Human Creature full grown, and in the State of Manhood ought to be ſolid, with a ſufficient Degree of Tenacity, without Acrimony, their chief Drink Water cold, becauſe in ſuch a State it has its own natural Spirit and Air, (which Heat deſtroys) with a Quantity of fermented Liquors proportion'd to their natural Conſtitutions.

4. The Courſe of the Fluids through the vaſcular Solids, and the common Animal Functions without any Violence, muſt in length of Time harden the Fibres, aboliſh many of the Canals, and make the Solids grow together; from whence Dryneſs, Weakneſs, Immobility, Debility of the vital Force both of the firſt and ſecond Digeſtion. Loſs of Teeth, Depravation of Maſtication, the Condition of old Age, which therefore demands a Diet reſembling that of Childhood often repeated, but not ſo copious in Proportion to the Bulk, emollient and diluting.

5. From the Doctrine of the fifth Chapter, it is likewiſe eaſy to determine the Inconveniences ariſing from the Exceſs of any one ſort of Diet. Too much Sea-ſalt produceth Thirſt, Hoarſeneſs, Acrimony in the Serum (which deſtroys its ſoft nutritious Quality) Eroſion of the ſmall Fibres, Pains, and all the Symptoms of the muriatick Scurvy.

6. Acids taken in too great Quantities, eſpecially ſuch as are auſtere, as unripe Fruits, produce too great a Stricture of the Fibres, incraſſate and coagulate the Fluids; from whence Pains, Rheu-

matiſm and Gout, Paleneſs, Itch, and other Eruptions of the Skin: Subſtances extremely ſtiptick are hurtful to the Nerves, and occaſion Palſies.

7. Spices in too great Quantities occaſion Thirſt; Dryneſs and Heat, quicken the Pulſe, and accelerate the Motion of the Blood, diſſipate the Fluids; from whence Leanneſs, Pains in the Stomach, Loathings, and Fevers.

8. Strong Liquors, eſpecially inflammable Spirits, taken in great Quantities, intoxicate, conſtringe, harden, dry, and ſtimulate the Fibres, and coagulate the Fluids. They corrode and deſtroy the inward Coat of the Stomach and Inteſtines, and if Digeſtion be a Putrefaction Spirits muſt by their natural Quality hinder that * they produce Debility, Flatulency, Obſtructions, eſpecially in the Liver, Fevers, Leucophlegmacy, and Dropſies, as by their ſtimulating they raiſe the Spirits for a Moment, to which ſucceeds a proportional Depreſſion; they create a Habit and Neceſſity of continuing the ſame Courſe, and increaſing the Quantity. Liquors in the Act of Fermentation, as Muſt and new Ale, are apt to produce Spaſms in the Stomach, Cholick and Diarrhæas.

9. A Diet of viſcid Aliment creates Flatulency and Crudities in the Stomach, Obſtructions in the ſmall Veſſels of the Inteſtines, in the Mouths of the Lacteals and Glands, Tumors and Hardneſs of the Belly, Coldneſs, Paleneſs of the Skin, and Viſcidity in the Fluids.

10. A Diet of oily Nouriſhment relaxeth the Solids, and particularly the Stomach and the Inteſtines, (Monks who take a great deal of Oil are ſubject to inteſtinal Hernias) it creates nidroſe Eructations, Loathings, Oily and bitter Vomitings, ob-

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* Vid. *Chiſelton's* Anatomy.

ſtructs the capillary Veſſels by hindering the Entrance of the watery and fluid Part, with which it will not mix; it creates Thirſt and Inflammations.

11. A conſtant Adherence to one ſort of Diet, may have bad Effects on any Conſtitution. Nature has provided a great Variety of Nouriſhment for Human Creatures, and furniſh'd us with Appetites to deſire, and Organs to digeſt them (there is a moſt curious Bill of Fair in Sir *Hans Sloan*'s Natural Hiſtory of *Jamaica*) as Aliments have different Qualities; a conſtant Adherence to one Sort, may make the Conſtitution verge to ſome of the Extremes mention'd in this Chapter; for healthy People, *Celſus*'s Rule l. Chap. I. is a good one, *Sanus homo qui bene valet & ſuæ ſpontis eſt, nullis obligare ſe Legibus debet, nullum cibi genus fugere quo populus utitur, interdum in convivio eſſe, interdum ab eo ſe abſtinere, modo plus, modo amplius aſſumere*, &c. The Senſe of the whole Paſſage, is, That a healthy Man under his own Government, ought not to tie himſelf up to ſtrict Rules, nor to abſtain from any Sort of Food in common Uſe, that he ought ſometimes to feaſt, ſometimes to faſt, ſometimes to ſleep, ſometimes to watch more than ordinary, *&c.* An unerring Regularity is almoſt impracticable, and the ſwerving from it, when it is grown habitual, dangerous; for every unuſual thing in a Human Body becomes a Stimulus, as Wine, or Fleſh-Meat to one not us'd to them; therefore *Celſus*'s Rule with the proper moral Reſtrictions, is a good one for People in Health, and even in Perſons diſeas'd in any of the Senſes of this Chapter, as too ſtrict, too lax, acid and bilious, *&c.* A conſtant Adherence to one Sort of Diet, may carry the Caſe beyond a Cure to the contrary Extreme.

12. General Rules about Diet, without Regard to particular Conſtitutions, are abſurd.

13. That with regard to different Conſtitutions, the common Diſtinction of Diet into Vegetable with Water, and Animal with fermented Liquors, is not proper and compleat. *Firſt*, Becauſe in the Enumeration of Conſtitutions in this Chapter, there is not one that can be limited and reſtricted by ſuch a Diſtinction, nor can perhaps the ſame Perſon in different Circumſtances be properly confin'd to one or the other. *Secondly*, Becauſe a vegetable Diet is not characteriz'd, there is not a general alimentary Quality in which all Vegetables agree; there are Vegetables, acid, alkaline, cooling hot, relaxing, aſtringent, acrid, and mild, *&c.* uſeful or hurtful, according to the different Conſtitutions to which they are apply'd, there may be a ſtronger Broth made of Vegetables than any Gravy-ſoup.

14. As Fleſh-Diet is generally alkaleſcent, and many Vegetables are acid and cooling; People of hot bilious Conſtitutions find themſelves extremely well in a vegetable Diet and Water, and the ſame Perſons perhaps had enjoy'd their Health as well with a Mixture of Animal Diet qualify'd with a ſufficient Quantity of Aceſcents, as Bread, Vinegar, and fermented Liquors.

15. The Oil of moſt vegetables in which their nutritious Quality chiefly conſiſts, ſeems not to be ſo hard of Digeſtion as that of Animals; fat Meat is harder to digeſt than the moſt oily Plant taken as Aliment: Sick People could not take ſo great a a Quantity of melted Fat, as they can of Oil of ſweet Almonds.

16. Animal Subſtances are more nouriſhing, and more eaſily tranſmutable into Animal Juices; than Vegetable, and therefore a vegetable Diet is more proper for ſome Conſtitutions, as being leſs nouriſhing.

17. As the Qualities of Plants are more various than thoſe of Animal Subſtances, a Diet of ſome Sorts of Vegetables may be more effectual in the

Cure of ſome chronical Diſtempers, than an Animal Diet.

18. The fibrous or vaſcular Parts of Vegetables ſeem ſcarce changeable in the Alimentary Duct. The Dung of Horſes is nothing but the Filaments of the Hay, and as ſuch Combuſtible.

19. Vegetables abound more with aerial Particles, than Animal Subſtances; and therefore are more flatulent.

20. Man is by his Frame as well as his Appetite a carnivorous Animal; the Inſtruments of Digeſtion are ſo well adapted to the proper Food of each Animal, that from the Structure of the Firſt, it is eaſy to gueſs at the Second. Moſt Quadrupedes that live upon Herbs, have inciſor Teeth to pluck and divide them: after they are ſwallow'd, they are brought up again from one Stomach to receive a new Alteration by a ſecond Maſtication, after that the Maſs ſo prepar'd, paſſeth through four Stomachs of different Figures and Structure before it comes into the Inteſtines. This is the Caſe of ruminating Animals, except ſome few; as of Hares who have but one Stomach, by which it appears, that Nature is at a great deal of Labour to tranſmute Vegetable into Animal Subſtances: Therefore Herb-eating Animals, which don't ruminate, have ſtrong Grinders, and chew much. There have been ſeveral Inſtances of ruminating Men, and that Quality leaving them, was a Symptom of approaching Sickneſs, Vid. *Philoſoph. Tranſact.* & *Bonet. Sepulchret. Anatom.* Granivorous Birds have the Mechaniſm of a Mill, their Maw is the Happer, which holds and ſoftens the Grain, letting it drop by Degrees into the Stomach where it is ground by two ſtrong Muſcles, in which Action they are aſſiſted by ſmall Stones which they ſwallow for the Purpoſe, and becauſe this Action of Grinding cannot be perform'd by the weaker Stomachs of their Young; many of them, as Pigeons, half digeſt the

Aliment before they give it. Some Birds that live upon Subſtances eaſiy diſſolvable, as Worms, Eggs, have the Coats of the Stomach ſmooth; as Cuckows. Birds of Prey that live upon Animal Subſtances, have membranaceous not muſcular Stomachs.

The beſt Inſtruments for dividing of Herbs are inciſor Teeth; for cracking of hard Subſtances, as Bones and Nuts; Grinders or Mill-Teeth; for dividing of Fleſh; ſharp-pointed or Dog-Teeth, which ſeem to be ſo neceſſary for that Purpoſe, that an Eagle has ſuch Teeth, not in his Bill, but two at the Root of his Tongue to hold his Prey, and three Rows in his Jaws at the Entry of his Gullet. A Human Creature has all the three Sorts of Teeth; the Teeth and Stomachs of ſome carnivorous Beaſts, don't differ much from the Human. A Lion has generally fourteen in each Jaw; four Inciſors, four Canine, and ſix Grinders, ſharpiſh, for dividing of Fleſh as well as cracking of Bones. A Human Creature has commonly ſixteen Teeth in each Jaw, two of them only Canine. The inward Coat of a Lion's Stomach has ſtronger Folds than a Human, but in other Things not much different. The Stomachs of Water-Fowl that live upon Fiſh are Human; therefore it ſeems that Nature has provided Human Creatures with Inſtruments to prepare and digeſt almoſt all Sorts of alimentary Subſtances, as Herbs, Grain, Nuts, by the Structure of their Parts as well as Appetites, they are plainly carnivorous.

21. It has been objected againſt this Doctrine, that Granivorous Animals have a long Colon and a Cæcum which in Carnivorous are wanting. Now it is well known that a Man has both, Vid. *Philoſophical Tranſactions*; to this it is anſwer'd that the Obſervation is not true without Exceptions; many carnivorous Animals have neither Colon nor Cæcum, and many Granivorous have both. There are Animals not carnivorous that have a large Cæcum and no Colon, and others that have neither.

There are carnivorous Animals, I mean ſuch as eat Fleſh ſometimes, that have both Colon and Cæcum; but as the Obſervation is generally true, it proves at leaſt that Mankind is deſign'd to take vegetable Food ſometimes, and it is a freſh Inſtance of Nature's being at more Labour to aſſimilate Vegetable into Animal Subſtances, by affording them a longer and more retarded Paſſage.

22. Carnivorous Animals have more Courage, muſcular Strength, Activity in Proportion to their Bulk, which is evident by comparing the Cat-Kind, as Lions, Tigers; and likewiſe the Dog-Kind with Herb-eating Animals of the ſame Bulk. Birds of Prey excel Granivorous, in Strength and Courage. I know more than one Inſtance of iraſcible Paſſions being much ſubdu'd by a vegetable Diet.

23. Fermented Liquors are proper, and perhaps neceſſary for ſuch as live upon an Animal Diet, for Fleſh without being qualify'd with Acids, as Bread, Vinegar, and fermented Liquors, is too alkaleſcent a Diet; and Wine moderately taken, rather qualifies the Heat of Animal Food than increaſeth it. Water is the only Diluter, and the beſt Diſſolvent of moſt of the Ingredients of our Aliment. It is found by Experience, that Water digeſteth a full Meal, ſooner than any other Liquor; but as it relaxeth, the conſtant Uſe of it, may hurt ſome Conſtitutions. As it contains no Acid, it is improper with a Diet that is entirely Alkaleſcent.

The Doctrine laid down in this *Eſſay*, is in moſt Particulars (I do not ſay in all) conform to that of the divine *Hippocrates*, as appears by ſeveral Paſſages of his Works; particularly of his Books of Diet, of his method of Diet in acute Diſeaſes, and *Galen*'s Commentaries both upon thoſe Books, and ſome others of his Works. I ſhall inſtance in ſome few Particulars as far as relates to that Part of Diet call'd Aliment, without referring to the Editions, Books and Pages, which would be of ſmall Uſe to my Readers. The Maxims of this great Man are, That Health depends chiefly upon the Choice of Aliment.

That the Phyſicians before his Time were to be blam'd, for not preſcribing Rules of Diet.

That he who would skilfully treat the Subject of Aliment, muſt conſider the Nature of Man, the Nature of Aliments, and the Conſtitution of the Perſon who takes them.

In his Books of Diet, he deſcribes the Qualities of all the Subſtances which Mankind generally feed upon.

As of all Sorts of Fleſh, many of which are not in Uſe amongſt us, as of Dogs, Foxes, Aſſes, Horſes.

That the Fleſh of Wild Animals is drier than that of Tame, of Stall-fed, than of thoſe fed by Paſtorage.

That the Fleſh of Animals, in the Vigour of their Age, and of ſuch as are caſtrated, is beſt.

That of Animals, which have not us'd hard Labour, is tendereſt.

That Beef is bilious that is alkaleſcent, as all Fleſh Meat is.

That the Fleſh of hot dry Countries is moſt nouriſhing.

He is very particular as to the Manner of Cookery, that roaſting deſtroys the Humidity.

That ſalted Fleſh ſhould be maſcerated and moiſten'd.

That ſalted Fleſh dries, attenuates, and moves the Belly.

He is likewiſe very curious in tempering the Qualities of his Meats, by Seaſonings of contrary Qualities.

He deſcribes the Qualities of the Fleſh of moſt Sorts of Fowl, that the Fleſh of granivorous Birds is not ſo moiſt and oily as that of Ducks; he is particular as to the Qualities of Fiſhes freſh and ſalted, and of all Vegetables both Alimentary and Medicinal; that Onions, Leeks, Radiſhes, *&c.* are hot and acrimonious, that ſome of them, as Muſtard, and Creſſes, will occaſion a Dyſury; that others as Lettuce, are cooling and relaxing; Selery, diuretick; Mint, hot; that the Cabbage Kind reſolve the Bile, that ſuch Herbs as are odorous are Heating, Legumes are flatulent, ripe Fruits laxative, and unripe, aſtringent.

That unripe Cucumbers are hard of Digeſtion.

That the Fruits of the Earth in hot Countries, are dryer and hotter than in cold.

He is no leſs exact in deſcribing the Qualities of Milk, Whey, all Sorts of Bread and Water, which he chooſes clear, light, without Taſte or Smell, drawn not from Snow, but from Springs with an Eaſterly Expoſition; tho' he ſeems to have known ſomething of Mineral Waters, he ſays nothing of the Uſe of them.

He is no leſs accurate in the Deſcription of the Qualities of ſeveral Sorts of Wines, black, white, auſtere, oily, thin, with the proper uſes of them, by which it appears, that Wine was ſeldom or never drunk in his Country without Water. He allows Wine unmix'd after great Diſſipations of the Spirits by Fatigue, and regulates the Quantities of it according to the Seaſons.

He likewiſe conſider'd the Medicinal Qualities of Aliments, and tells you, that of Aliments ſome are laxative, ſome moiſten, ſome dry, ſome bind, ſome move Urine.

Indeed the Qualities which he aſcribes to alimentary Subſtances, are the four in common Uſe amongſt the Ancients, as hot, cold, moiſt, and dry; according to thoſe, his Notions are often very juſt and inſtructive, and nothing can be more ſo than what follows, that acid, acrid, auſtere and bitter Subſtances do not nouriſh; but by their Aſtringency create Horror, that is, ſtimulate the Fibres; that ſweet, oily and fat Things are nouriſhing and anodyne, that Water dilutes and cools, that Honey is detergent, and Vinegar profitable to bilious Conſtitutions: No leſs judicious are his Intentions in the Cure of Diſeaſes by Aliment.

That Diſeaſes depend on the Parts contain'd, and the Parts containing, that is, on the Fluids and Solids.

That the ſolid Parts were to be relax'd or aſtricted as they let the Humours paſs, either in too ſmall or too great Quantities.

That Animals conſiſt of Fire and Water, which Diviſion is not ſo uncompleat as one may imagine; for by Water he ſeems to underſtand the unactive, and even the ſolid Parts, and by Fire all the volatile and active Parts, and that the difference of Conſtitutions, conſiſts in the Exceſs or Defect of theſe Principles, and he compares the due Mixture of them to a Sort of Harmony.

That there are in a Human Body Bitter, Salt, Sweet, Acrid and Inſipid.

That Contraries are the Remedies of their Contraries.

That Health conſiſts in a due Proportion of Blood, Pituite and Gall.

That Redundance of Blood and Gall, are the Cauſes of acute Diſtempers.

That long Abſtinence occaſions Bitterneſs in the Mouth and beating of the Temples, and he finds fault with the Phyſicians that ſtarv'd their Patients in the beginning of a Diſtemper, and gives a Reaſon for it conformable to the Principles laid down in this *Eſſay* that it dry'd too much, that is, the liquid Parts were diſſipated.

That a Man cannot be healthy and digeſt his Aliment without Labour, and that the Quantity and Kind of Diet muſt bear a due Proportion to the Labour. His Commentator *Galen* lays down this Aphoriſm.

Young, hot, ſtrong and labouring Men may feed on Meats giving both a hard and groſs Juice (as Beef, Bacon, powdered Fleſh and Fiſh, hard Cheeſe, Rye-Bread, and hard Eggs, *&c.*) which may nouriſh ſlowly, and be concocted by Degrees; for if they ſhould eat Things of light Nouriſhment, either their Meat would be too ſoon digeſted, or elſe converted into Choler.

And again, Milk is fitteſt for young Children, tender Fleſh Meat for them that are growing, and liquid Meats for ſuch as have acute Diſeaſes.

Hippocrates obſerves, that Paleneſs is the Effect of Acidity.

That the Choice of Diet ſhould be according to the difference of Conſtitutions, as in phlegmatick Conſtitutions, Fiſh and Fleſh well ſeaſon'd: The Fleſh of Fowls (which is an alkaleſcent Diet) not many Vegetables, black auſtere Wines. In dry Temperaments, lenitive Fruits, Figs, Raiſins, and ſoft Wines. In ſuch as have a bad Digeſtion, and moiſt Bellies, (the Caſe of acid Conſtitutions) the Fleſh of Fowl, which is a Diet both alkaleſcent and of eaſy Digeſtion; for ſuch as have dry Bellies, Pot-Herbs.

Galen this Commentator tells you, that bitter Subſtances engender Choler and burn the Blood, giving no general Nouriſhment to the whole; howſoever they may be acceptable to ſome one Part, that is, (according to what was ſaid in this *Eſſay*) that they are a Sort of ſubſidiary Gall: And again, ſharp Spices are moſt unfit for tender Bodies, whoſe Subſtance is eaſily melted and inflam'd. However, ſtrong Men may eat them with groſs Meats, and conſequently by the Principles of the *Eſſay*; Spices by their melting Quality are proper for fat People: Meats over-ſalted are dangerous: Inflammations, Leproſies, Sharpneſs of Urine, and great Obſtructions happening to ſuch as uſe them much, agreeing with none but ſtrong Bodies, as Sailors, Soldiers, and Husband Men, accuſtom'd to hard Labour, and much Toiling.

Fat Meats are not good but for dry Stomachs; for in ſanguine and cholerick Stomachs; they are ſoon corrupted; in phlegmatick Stomachs, they procure Looſneſs, and hinder Retention.

When any Man is ſick or diſtemper'd, let his Meats be of contrary Qualities to his Diſeaſe; for Health itſelf is but a Kind of Temper gotten and preſerv'd by a convenient Mixture of Contrarieties. Accordingly, in Fevers the Aliments preſcrib'd by *Hippocrates*, were Ptiſans and Cream of Barley. Decoctions of ſome Vegetables likewiſe with the Mixture of ſome acid, Hydromel, that is, Honey and Water, Oxymel, Honey and Vinegar, then Wines without Flavour diluted with Water, when there was no Tendency to a *Dilirium*. Water, Vinegar and Honey in Pleuriſies and Inflammations of the Lungs. Sometimes he mixeth Spices, which ſeems odd; but that muſt have been for promoting Expectoration; and even in Ulcers of the Lungs, he preſcribes Fat and Salt for the ſame Purpoſe; and to Women troubled with Pains after Child-bearing, he mixeth his Ptiſan with Leeks and Fat; which Practice no doubt he had found ſucceſsful.

He preſcribes great Quantities of Aſſes Milk as far as an *Engliſh* Gallon in proper Caſes, eſpecially as a Reſtorative; and to ſuch as had hot, dry Conſtitutions, Aſſes Milk, Whey and Abſtinence from Fat and Oil.

No leſs judicious are his general Maxims for preſerving of Health.

A Diet moderate in Quantity with a due Degree of Exerciſe.

That ſuch as are of hot Conſtitutions, ſhould abſtain from violent Exerciſes, uſe Bathing in hot

Water, rather than Unctions, feed upon Maize (which is his favourite Food) and Pot Herbs.

That one muſt not accuſtom one's ſelf to a too regular Diet, becauſe the leaſt Error is dangerous.

That all ſudden Alterations in Extremes, either of Repletion, Evacuation, Heat or Cold, are dangerous.

Galen, ſpeaking the Mind of *Hippocrates*, tells us, That the whole Conſtitution of Body may be chang'd by Diet.

That we ſhould take thoſe Kinds of Meats which are beſt for our own particular Bodies, for our particular Age, Temperature, Diſtemperature, and Complexions; for as every particular Member of the Body is nouriſh'd with a ſeveral qualify'd Juice; ſo Labourers, and idle Perſons, Children and Striplings, old Men and young Men, cold and hot Bodies, phlegmatick and cholerick Complexions muſt have diverſe Diets. It is eaſy to produce a great many more Inſtances to prove the Conformity of the Doctrine of the *Eſſay*, with the Notions and Practice of *Hippocrates*; but thoſe already mention'd are ſufficient, and may be of uſe to ſome Readers to confirm by Authority, what they will not be at the Trouble to deduce by Reaſoning.

FINIS.

MVSEVM
BRITAN
NICVM